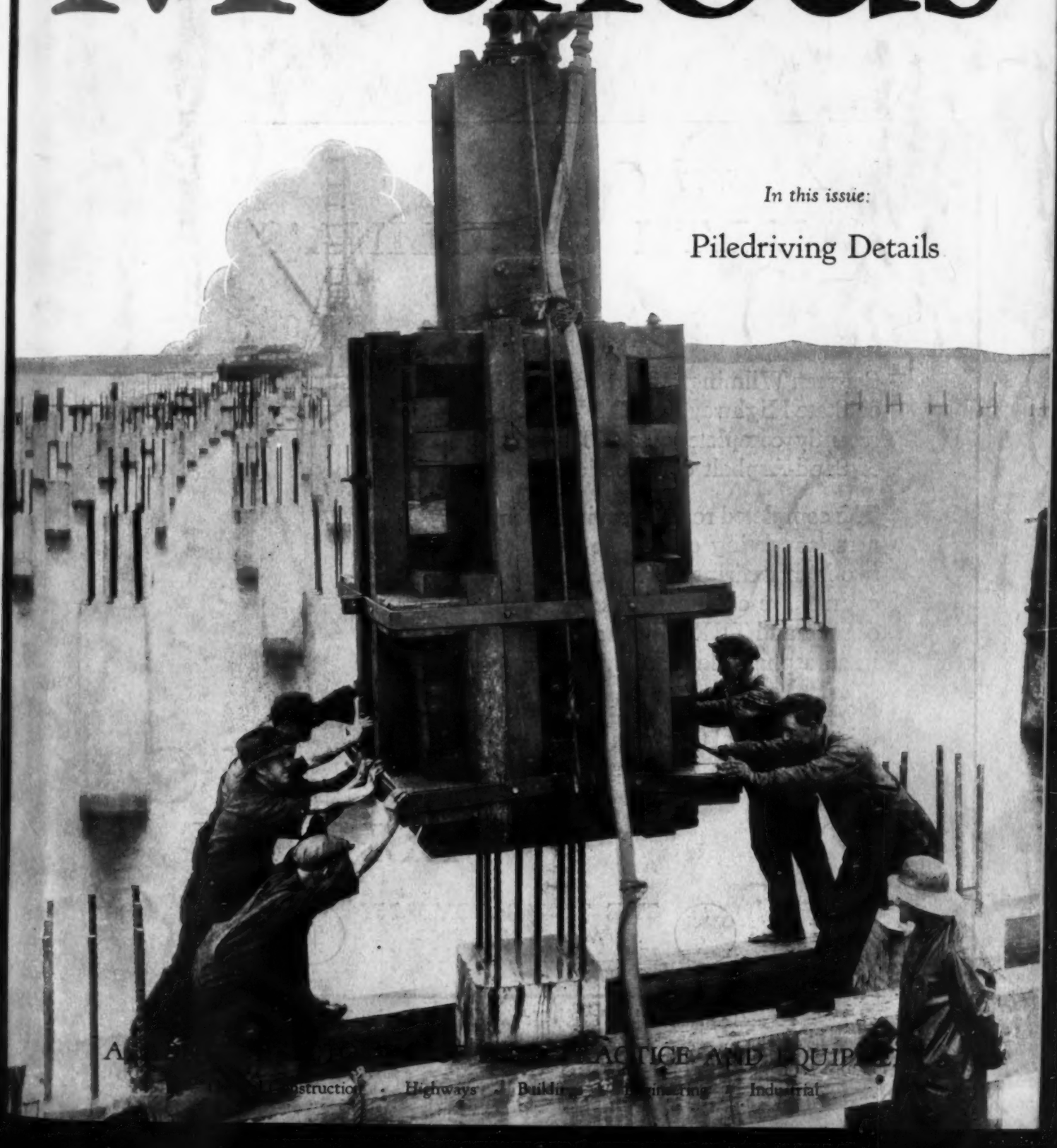
McGraw-Hill Publishing Company, Inc., New York, N. Y.

May
1929

Construction Methods



In this issue:

Piledriving Details

A[illegible] PRACTICE AND EQUIP[illegible]

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Construction Methods, May, 1929, Vol. 11, No. 5. Published Monthly. McGraw-Hill Publishing Company, Inc., Tenth Ave. at Thirty-sixth St., New York, N. Y. Two years for $1; per copy, 5 cents. Entered as second-class matter, October, 1926 issue, Vol. 8, No. 10, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Printed in U. S. A.

What's Doing This Month

Looking it over with the Editor

Unlimber That Camera!

IN NO other industry are conditions more favorable for a pictorial record of methods and equipment than in the construction industry. With a few exceptions, such as tunneling and submarine work, operations are handled out in the open, with light and weather ideal for the taking of clear-cut pictures that tell an interesting and instructive job story.

Engineers and constructors now regard the construction photograph as something more than a matter of merely passing interest. Properly taken, it constitutes an accurate and valuable record of field practice, job layout and plant detail, often telling at a glance a more complete and a more easily understandable story than pages of text.

With the coming of summer construction operations are speeding up and field work will soon be in its full stride. Now is the time to unlimber that camera of yours and to plan a systematic pictorial record of your job. A few suggestions on taking pictures of construction work may prove helpful:

Don't limit your photos to a few general shots taken from a hillside half a mile away from the work. Every contract is full of interesting construction *details*. Get pictures which show them up *at close range*.

Time your shots to show plant or personnel in action—doing something in an interesting or ingenious manner.

Don't let men stop work and pose for a picture. Take them while they are busy on their regular duties.

Keep constantly on the lookout for time-saving job "kinks." Every worth-while superintendent develops and uses scores of them. Get close-up shots illustrating just how these "kinks" work.

Before you press the button, compose your picture in the view-finder of your camera. See that it shows what you want. Don't anchor yourself in one place. Move about until you get the point of view for what you wish to show. Don't just aim your camera in the general direction of your subject and trust to luck.

Give your exposures plenty of time. Most amateur photographic failures are due to under-exposed negatives.

Especially on close-up shots estimate, pace off or, better still, measure with a tape your distance from your subject. Then set the distance scale on your camera accurately to the correct reading. Don't forget to change the setting for the next picture.

In releasing the shutter don't give the button or lever a violent "push" or "snap." This causes the camera to move and produces a blurred negative. A slow, steady "squeeze" is best in taking pictures, just as it is in firing a rifle. The crack shots will tell you that they never "pull" the trigger—they "squeeze" it.

Finally, when you get a set of good pictures of interesting job details, illustrating effective applications of method or equipment, remember that the editor of *Construction Methods* may be able to use—and pay for—them.

Capsule Characterization

Across the luncheon table, after a trip over the job, a contractor with a rich background of experience was regaling the editor with frank and racy comment on engineering personalities.

"Him?" said the contractor, answering an inquiry regarding an engineer on a job completed several years ago. "He's the sort of an engineer that insisted on being called 'Mister'—and on a sewer job, too!"

CONSTRUCTION METHODS

A monthly review of modern construction practice and equipment

PUBLISHED BY
McGRAW-HILL PUBLISHING COMPANY, INC.
TENTH AVENUE AT 36TH ST., NEW YORK

On the Mississippi

CONTRACTORS the country over have the keenest interest in the construction program involved in controlling Mississippi River floods. Speaking recently before the Associated General Contractors, Brig.-Gen. T. H. Jackson, president of the Mississippi River Commission, indicated that construction men would have to find new solutions to old problems of earth-handling. The raising of existing levees will mean an increase of 60 per cent in their cross-sectional area with base widths of 300 ft. or more. Levees with base widths over 250 ft. will be very common. With regard to them, General Jackson said: "This introduces a new problem in earth handling. I doubt if there is any existing earth-handling plant which can move material with one movement into those large levees. That is one of the problems that we believe confront the contracting profession—development along the lines of earth-moving machinery. The new levee sections are too great for existing machines except by repeated handling." On the Mississippi work, therefore, both contractors and machinery manufacturers will have an opportunity of tackling earth-handling problems by new methods and with new forms of equipment.

MIXER DELAYS—"With a one-minute mix specification, a modern concrete paver can mix 48 batches per hour. The difference between this and any lower rate of production is due to delays. The total delay may be made up of large delays, when the paver ceases to operate, or small delays, many of which are too small to detect without a stop watch, but which may, and often do, amount to several hours of lost time during the day and to several days during the construction season."—WILLIAM A. BLANCHETTE, Associate Highway Engineer, U. S. Bureau of Public Roads.

Acknowledgment

WITH this issue *Construction Methods* completes its third year as a McGraw-Hill publication. It is appropriate, therefore, that we should pause here to acknowledge our obligation to those who have helped to make possible its extraordinary progress.

For it *has* been extraordinary. Starting from scratch in June, 1926, *"Methods"* now lists more than 30,000 subscribers. Through its pages 119 manufacturers regularly advertise their products to the construction industry. And month by month it grows.

Three years ago *"Methods"* was an experiment. For more than a decade progress in construction materials and machinery had been little short of phenomenal. Out of this had grown new standards of field practice.

Progress and profits had come to depend more and more upon the skillful layout of plant and choice of equipment. Rule-of-thumb must give way to more precise and scientific methods, and construction seemed to be setting itself up on a "production basis."

The field man had earned the right to a paper that would be devoted wholly to his problems of methods, and *Construction Methods* was our answer to that need.

Today the experiment has proved itself. "Methods-minded" men everywhere have recorded their endorsement of its effort. Among them we find the officers of large construction organizations, independent contractors, construction engineers, superintendents and foremen in immediate charge of field work—but whatever their tasks or titles, they have one common interest. They are "methods-minded" men, responsible for the conduct of construction on the modern scale—better, faster, more efficient. Their major interest is construction methods and to that interest we have dedicated this journal.

Many have contributed to the progress thus far—the subscribers, whose endorsement has heartened the editors, the contributors, whose articles and pictures have helped the paper to do its job, the advertisers, whose co-operation has made the publication possible, and many more whose counsel and support cannot be recounted here.

To all of these and to each of them we offer this acknowledgment of grateful appreciation.

Willard Chevalier

Publishing Director

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CHANGE OF ADDRESS
Subscribers are requested to send both the old address and the new address when they move to a new address.
Member—Audit Bureau of Circulations
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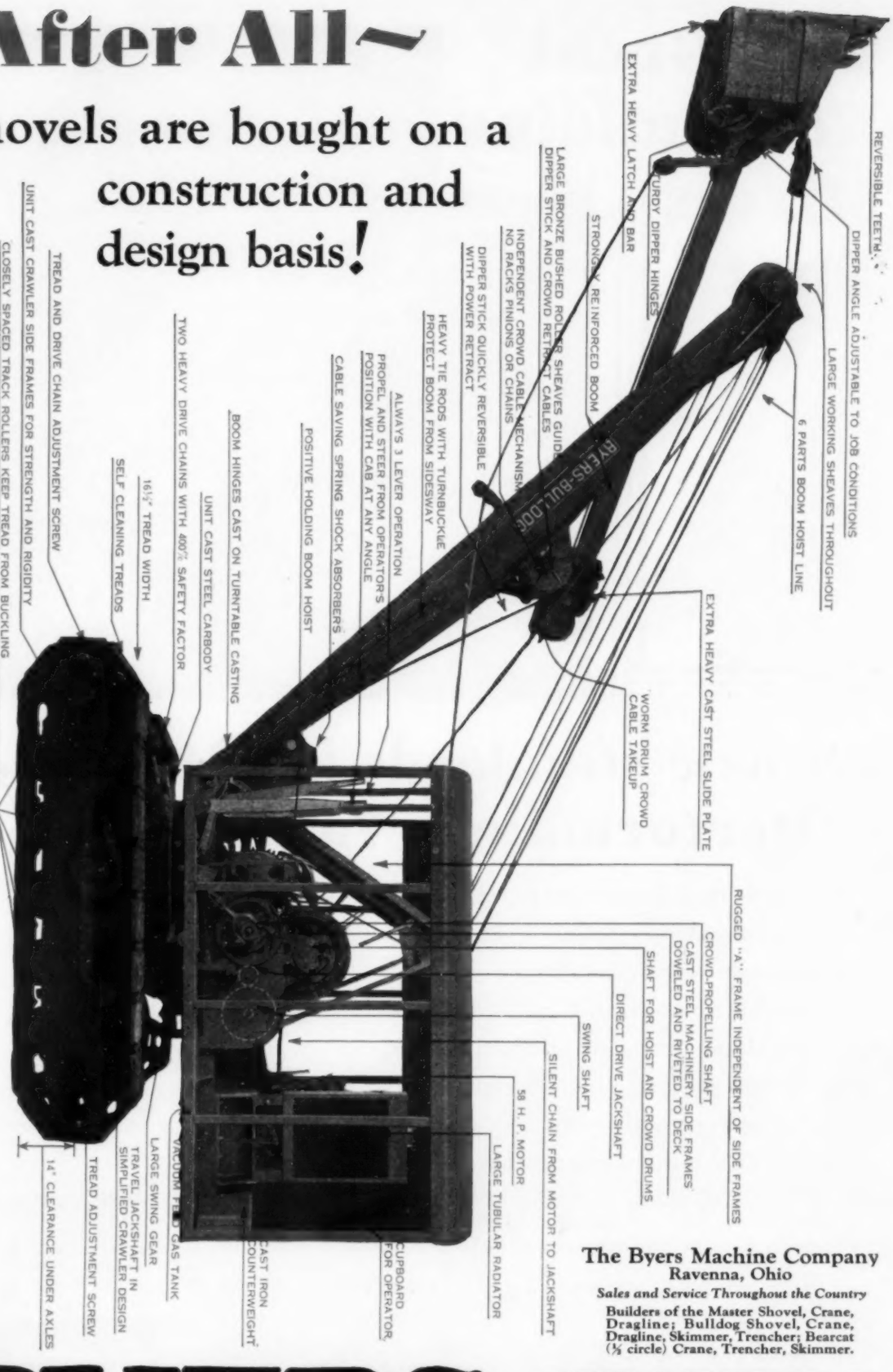
After All~

Gas shovels are bought on a construction and design basis!

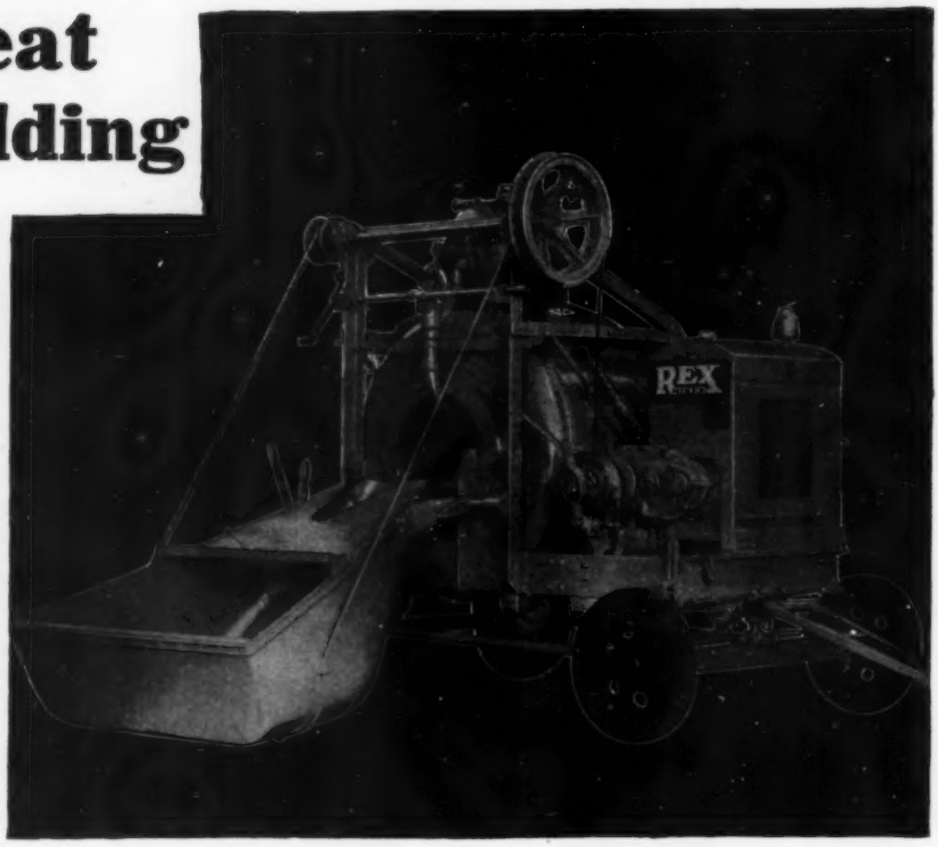


The Byers Machine Company
Ravenna, Ohio
Sales and Service Throughout the Country

Builders of the Master Shovel, Crane, Dragline; Bulldog Shovel, Crane, Dragline, Skimmer, Trencher; Bearcat (½ circle) Crane, Trencher, Skimmer.

BYERS SHOVELS ..CRANES

Two Great New Building Mixers That



set new standards in Design, Performance, Value

Gone are the thousand-pound top frames—

Gone are long countershafts to work out of line—

Gone are water valves that dribble—

Gone are old-fashioned, easily frozen drum rollers—

Gone are clumsy, exposed, grinding gears—

Gone is slow charging and discharging—

Gone is cast iron engineering.

In spite of far advanced engineering and performance, Rex production facilities set prices on both the Rex 7-S and 10-S that establish new standards of value for every contractor's dollar.

See these two great mixers—coupon brings this catalog.

CHAIN BELT COMPANY, *764 Park St., Milwaukee, Wis.*

The Brand New Rex 7-S—patterned after the proven 10-S—end controls—Springhung axle—7-second charge and discharge—skeleton top frame—7-second accurate water—no countershaft—all clutches, take-offs, etc. assembled with engine—Timken Bearings—Pressed steel drum rollers and drum heads.

The Improved Rex 10-S—proved in basic design by a year on the test block—by a second year in the field—end controls—7-second charge and discharge—skeleton top frame—7-second accurate water—no countershaft—all clutches, take-offs, etc. assembled with engine—Timken Bearings—Pressed steel drum rollers and drum heads.

REX MIXERS

(Reg. U. S. Pat. Off.)

CHAIN BELT COMPANY
764 Park Street, Milwaukee, Wis.
Send me Catalogs on the mixers I've checked.

½-bag tilter	☐	2- to 3-bag 14-S	☐
½- to 1-bag 5-S	☐	6-bag 28-S	☐
1-bag 7-S	☐	12-bag 56-S	☐
1- to 2-bag 10-S	☐	27-E Paver	☐

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Reach out for the truck

The Northwest Close Quarter Crowd brings you the short boom and long sticks necessary for basement excavation and other close quarter work —and still there is no loss of digging force while crowding.

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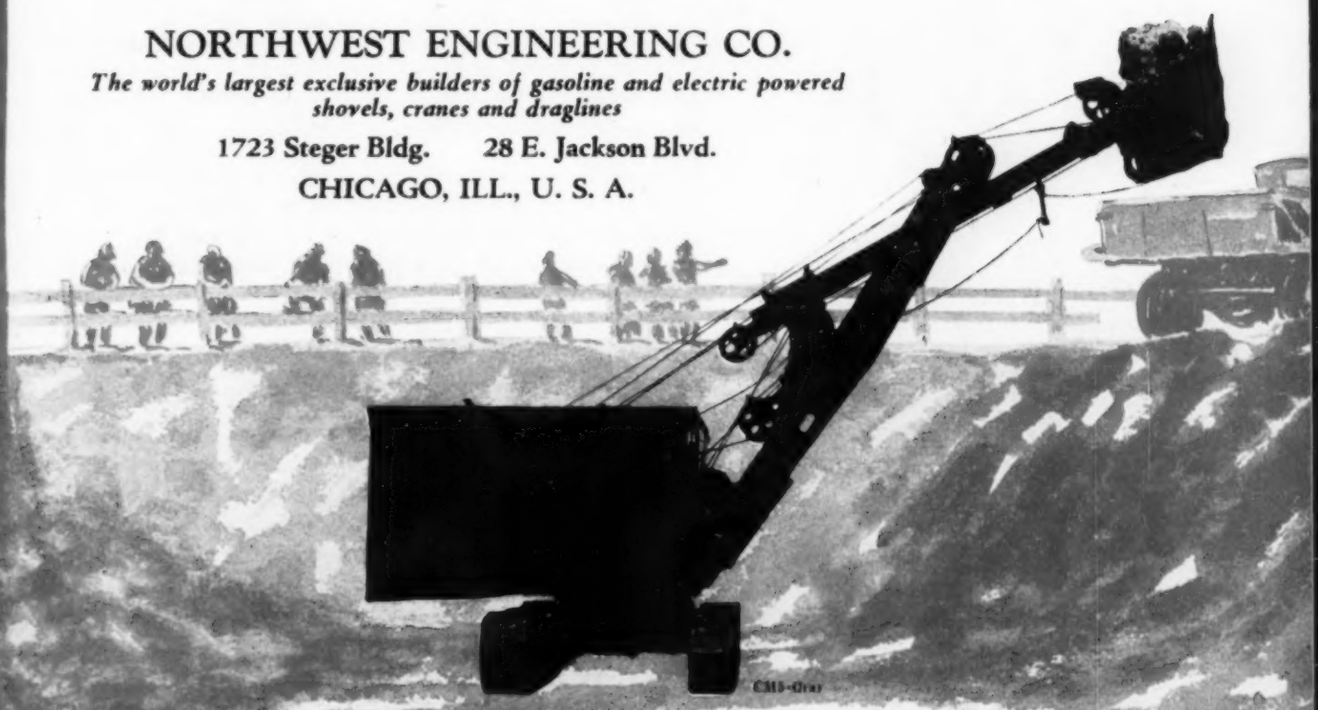
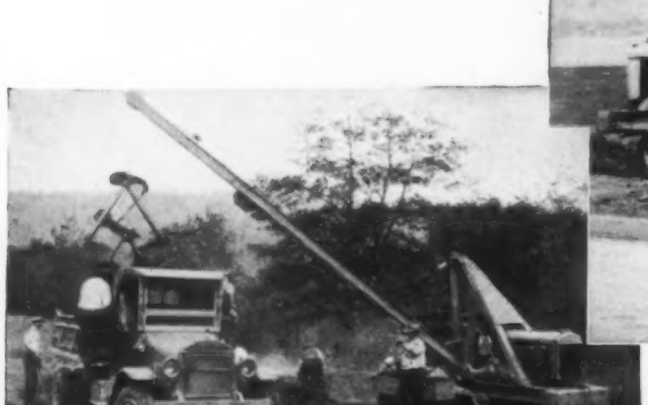


NORTHWEST

An Announcement

to the Users of Power Shovels and Excavating Equipment . . .

Power Shovel, Model B. A Powerful Speedy Unit of ⅜ yard capacity and ¾ swing



Clam Shell, Model B, with ⅜ yard bucket

Model B Trench Hoe

Model B Drag Line

Model B Crane

Model B Backfiller

THE Universal Power Shovel Company, now a subsidiary of the Unit Corporation of America, is recognized as one of the pioneers in the small power shovel field.

Due to superior engineering, sound construction and universal distribution its products are well and favorably known throughout the world. Its business at the present time is more than double the business for the corresponding period in any preceding year. Unfilled orders on hand indicate that increased production facilites will soon be necessary.

Backed by the vast resources of the Unit Corporation of America it is anticipated that even more rapid progress will be made in the future than in the past, and we can assure purchasers that they will receive even greater values than ever before, plus the highest quality materials, sound engineering, prompt and courteous service.

We have just prepared a new illustrated catalog covering the Model B unit, giving complete specifications and operating data. Write today for your copy.

UNIVERSAL POWER SHOVEL CO.

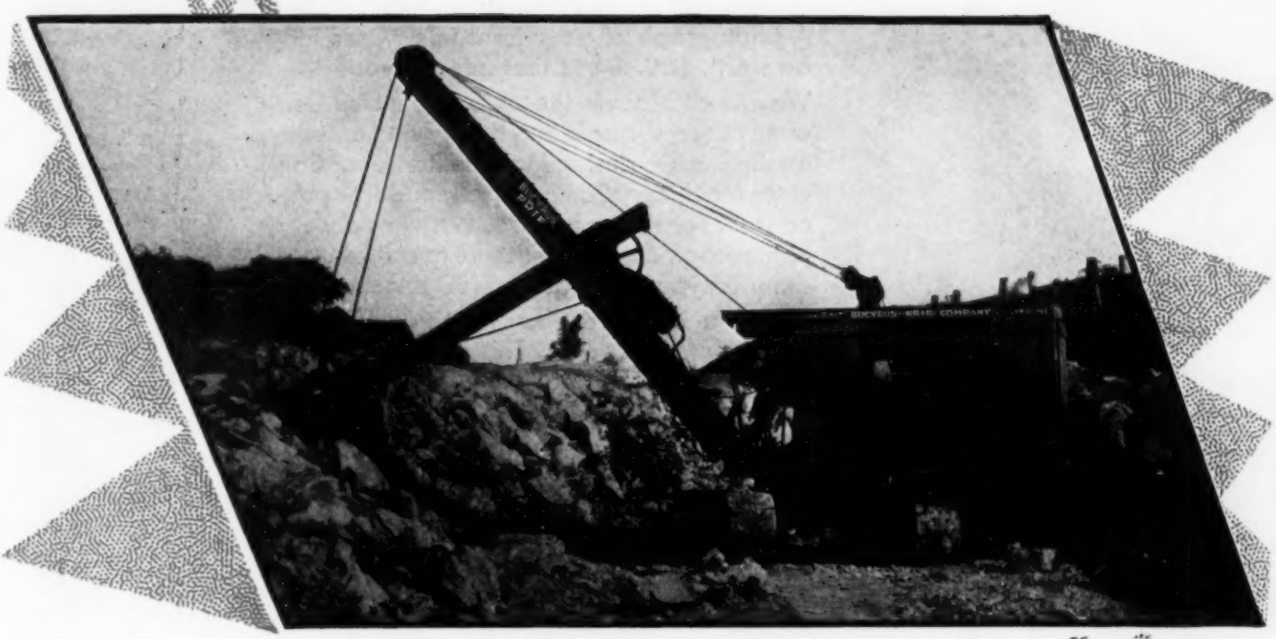
Division of Unit Corporation of America

15841 Second Boulevard

Detroit, Michigan

Building more Gas + Airs than ever before!

Also larger production schedule for Diesel + Air machines



Never before, since the Gas+Air was introduced, has the beginning of the year shown such a strong demand for Gas+Air shovels, draglines and cranes.

At a time when many manufacturers are cutting their production on shovels and cranes—BUCYRUS-ERIE *is building more Gas+Air and Diesel+Air machines than ever before!*

Hundreds of reports show superiority of Direct Drive Shovels and Cranes

Read some of the reports from the hundreds of owners of Gas+Air BUCYRUS-ERIES, in our new 64-page book, "Making More Money with the Gas+Air," sent on request.

These reports show how owners have been able to get unequalled Big Production with these machines as shovels, cranes, clamshell outfits, and draglines—on every class of work.

DIRECT DRIVE is the prime reason for the Gas+Air's outstanding success. The shovel has direct-connected engines, air operated, both for crowding and swinging—engines that start instantly at the touch of a throttle lever. *Saving time on every digging cycle.*

Crane and dragline work also are faster: These machines swing faster and can exert full swinging power and full hoisting power simultaneously.

Of course the Diesel+Air machines have exactly the same advantages.

Have you seen the new book, *"Making More Money with the Gas+Air?"* Drop us a line and get it!

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MIXERS
PNEUMATICS
WANTED
photographs of old ransome mixers
A photograph of your Ransome Mixer may be worth $50. Does that interest you?
We want to locate the oldest Ransome Concrete Mixer, still hale and hearty and actually on the job. So during May the Ransome Concrete Machinery Company will conduct a prize contest for that purpose. Why not enter a photograph of your Ransome in actual operation, for your share of the $100 prize money?
Ransome Mixers are known throughout the world for their long life. This contest will clinch that statement.
We know the list of "Ransome Long-Life Records" is going to be an imposing one, but we want to know where the actual "Daddy of Them All" is still on the job. It makes no difference what the model. "Old age, and still in service," is what counts.
CHUTES~
MIXERS
STEEL TOWERS
Here are the conditions:—Send us
(a) a photograph of your Ransome Mixer working on a job in May, 1929.
(b) The shop number or the name of original purchaser and date. (This information is absolutely necessary).
(c) Written permission to use the photograph in future advertising—and last but not least
(d) Any additional comment you may care to make on your Ransome equipment. If you wish, write us freely of your experience in general with your Ransome Mixer and elaborate with details of any instances you deem worthy of special merit.
Remember: $50 to the owner or operator of the "Daddy of Them All."
$25 to the second oldest Ransome Mixer.
Five—$5 "consolation prizes" for the most interesting and informative letters.
Decision of 3 competent judges to be final.
In case of tie for any prize offer, the full amount of such prize will be awarded to each tieing contestant.
TILTING MIXERS
PAVERS
Contest opens May 1st. Send us your entry on or before May 31st, 1929
RANSOME
Ransome Concrete Machinery Company
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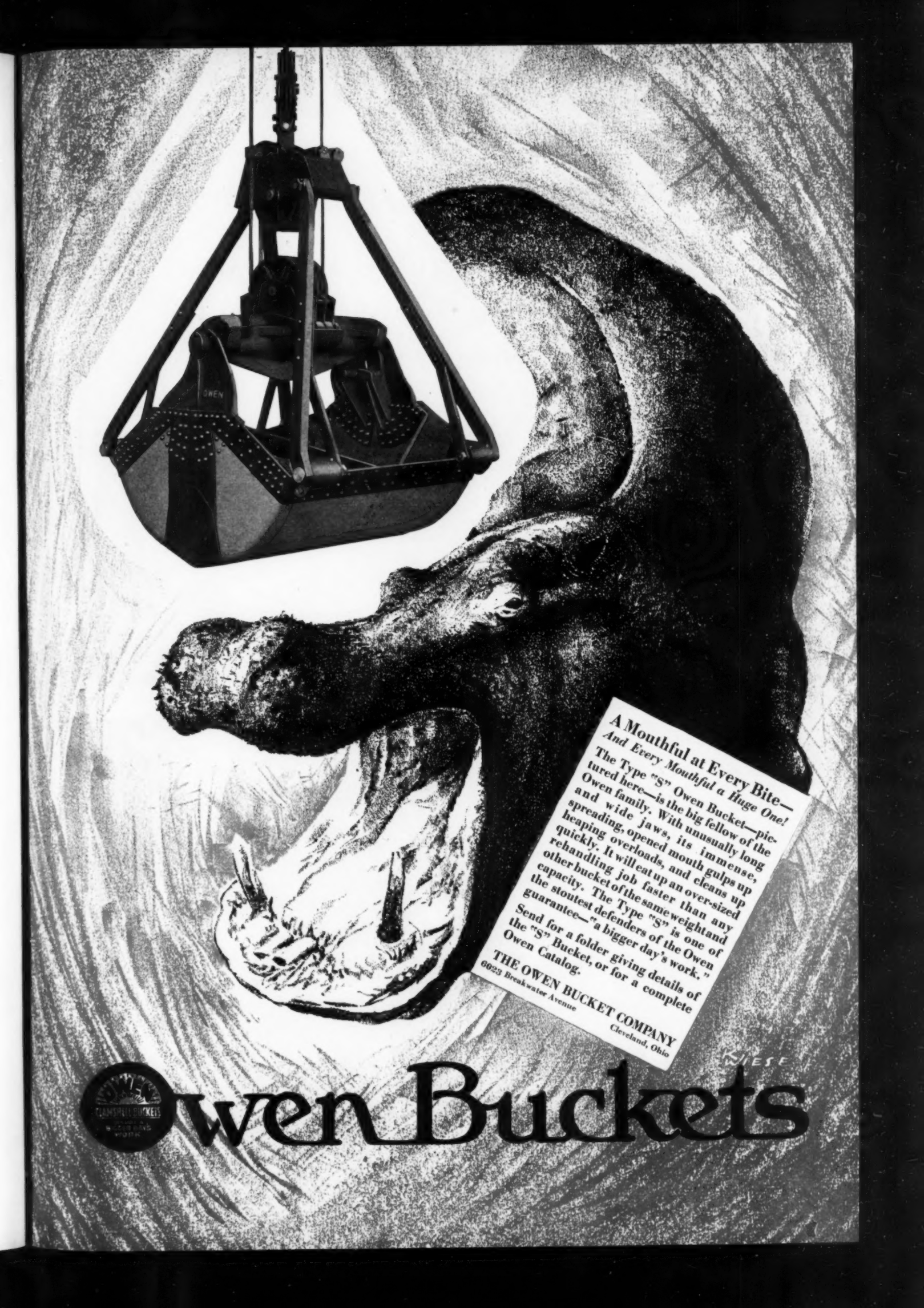
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And Every Mouthful a Huge One!
The Type "S" Owen Bucket—pictured here—is the big fellow of the Owen family. With unusually long and wide jaws, its immense, spreading, opened mouth gulps up heaping overloads, and cleans up quickly. It will eat up an over-sized rehandling job faster than any other bucket of the same weight and capacity. The Type "S" is one of the stoutest defenders of the Owen guarantee—"a bigger day's work."
Send for a folder giving details of the "S" Bucket, or for a complete Owen Catalog.
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Owen Buckets

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Here's a portable lantern that flashes a danger signal that *makes* itself seen

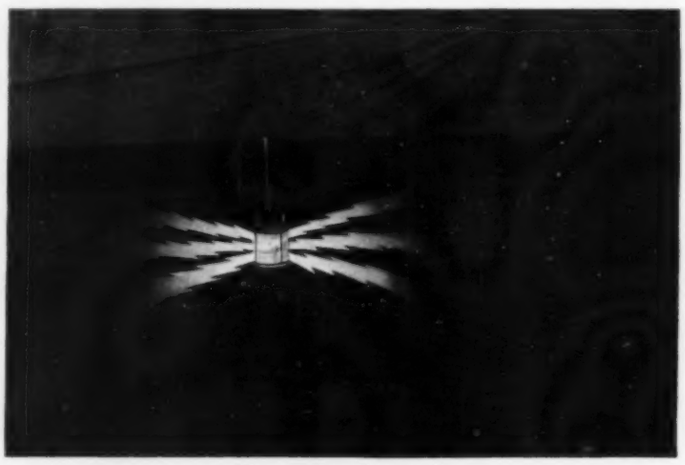
All night long this warning flasher sends out its piercing red signal of danger unaffected by wind or rain

THE Eveready Portable Flasher shoots an *intermittent* warning light! The flash-stop-flash feature is unique in portable signals. This winking beam of light pulls the eye's attention!

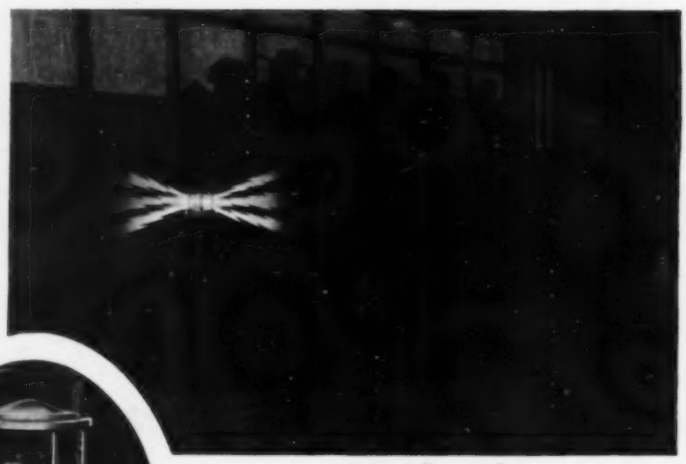
The brilliant, arresting flashing light penetrates far down the road at night. The Eveready Portable Flasher is an ideal emergency warning for repairs along municipal or county highways. Many city commissioners or managers are instructing their street and park department trucks to carry handy Eveready Portable Flashers. In automobile tow-cars, and for use on heavy stationary and loading machinery it is invaluable.

And the Eveready Portable Flasher is always ready! Made of strong steel, with top cadmium plated, it will last for years. Four strong, sturdy Eveready Dry Batteries supply sure, certain power for two to three months at a time. Maintenance costs are lower than the old-fashioned lanterns. Once placed it operates automatically and requires no daily inspection. A padlock is supplied so that the flasher can be secured by a chain against theft. And the Eveready Portable Flasher can be used around inflammable materials without danger of fire!

The Eveready Portable Flasher is sold through National Carbon Company's distributors.



For construction work



As a traffic warning

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EVEREADY
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PORTABLE FLASHER
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Specifications—Height 16 inches. Diameter of base 7 inches. Weight, including batteries, 16½ pounds. Requires four standard Eveready 6-inch Dry Cells connected in series to deliver 6 volts. Extra 6-volt lamp inside battery housing. Battery compartment constructed of seamless steel attractively finished in red. Top of flasher cadmium plated for weather protection. Heavy fresnel-type glass lens in red or other colors. Padlock for battery compartment with an extra-long hasp so that the device can be chained. This flasher is of rugged construction throughout and entirely weather-proof.

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4 cylinder engine

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Better Performance ~ All Steel Build

Now—better Mixers for less money. That's the sum and substance of Leach's startling *Price Reductions.*

You get the better performance at a smaller cost, because of new time and money saving features.

On the New Leach 7-S there is a 4 cylinder engine at far below former 2 cylinder prices. This means *more power, smoother power.* Then there is the famous Leach All-Steel Construction, which means longer life.

Altogether—you can't beat the 1929 Line of Leach Mixers *at the price.* Send for catalog today. You can't afford not to get full information.

LEACH COMPANY
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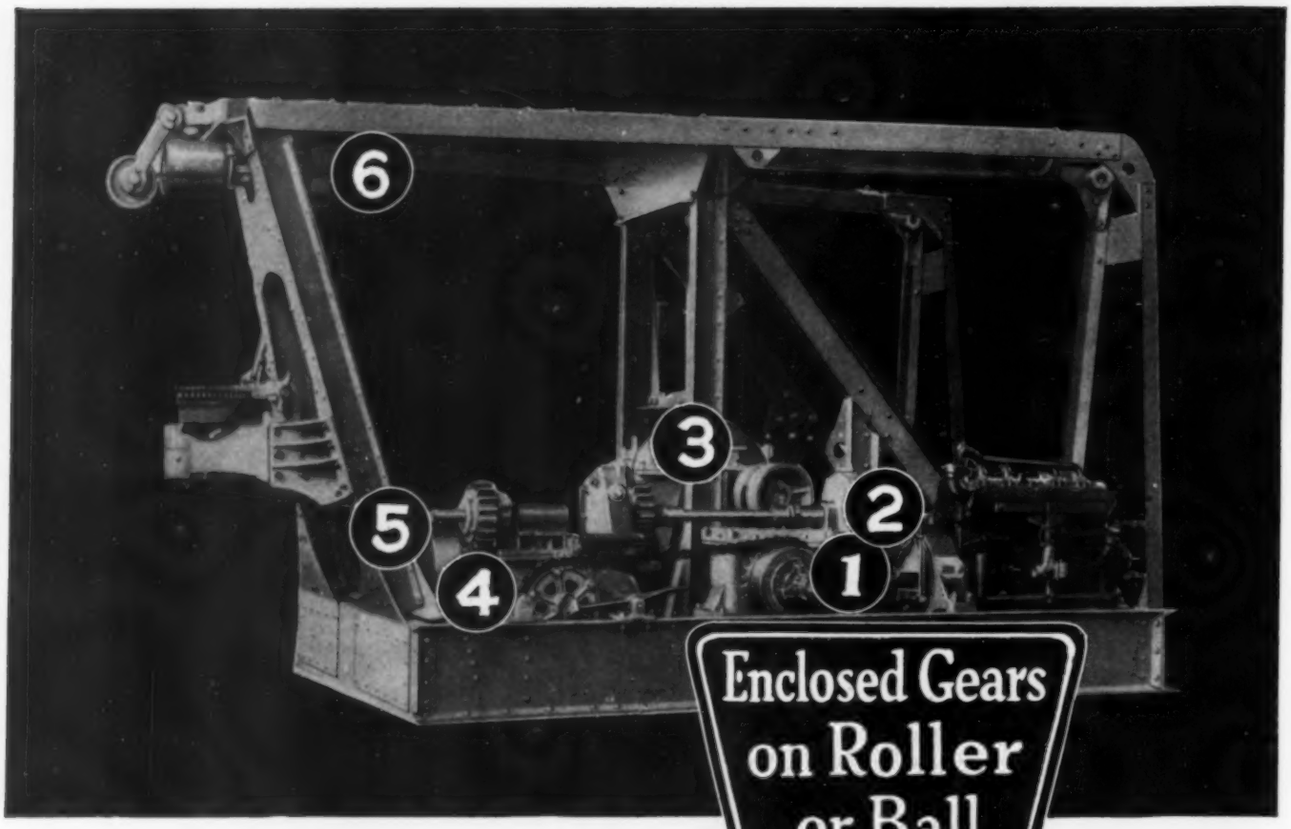
LEACH MIXERS



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THE lubrication problem solved by *self-lubrication!*

Friction reduced to the vanishing point! Smooth, vibrationless, strainless operation that adds immeasurably to day-to-day, year-to-year dependability and service life!

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FAST too! Automatic cycle of operation in 69 seconds including one minute mixing!

(1) Reduction gear unit (2) Drum drive unit (3) Skip hoist unit (4) Traction unit (5) Power discharge unit (6) Boom bucket drive unit.

Know the new Greater 27-E Koehring! Write for full details today.

SIZES

Pavers — 27-E six cylinder Waukesha engine, automatic operations. 13-E four cylinder Waukesha engine. Comply with A. G. C. standards.

Subgrade Planers — Built for all types of roadway, 8′ to 27′ widths; attachable to 27-E Paver.

Construction Mixers — 14-S, 21-S, 28-S. Trucks or skids; rubber tires optional. 28-S skids only. Weigh Mix attachments on 14-S. Comply with A. G. C. standards.

Dandie Mixers — 5-S, 7-S, 10-S. 5-S single cylinder, 7-S two or four cylinder, 10-S four cylinder gasoline engine. Charging skip or low charging hopper and platform. Rubber tired or steel rimmed wheels. Comply with A. G. C. standards.

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The Greater KOEHRING

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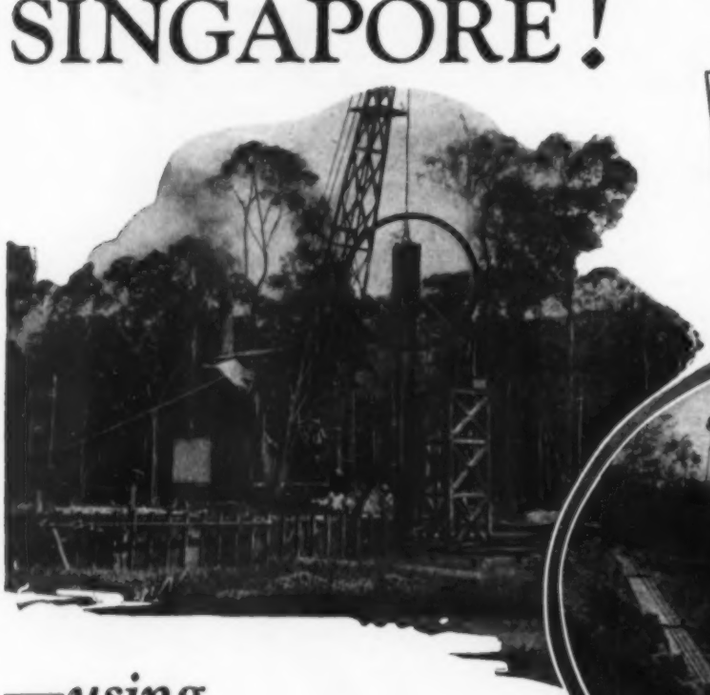
Construction Methods from SINGAPORE!



—*using* McKIERNAN-TERRY Hammers of course

From our sole European Sales Agents, the British Steel Piling Company of London, we received these photos and rough diagram of McKiernan-Terry No. 7 Hammers on the job on 'tother side of the world.

It seems the Singapore Water Supply Scheme requires two dams—one at Pontian, another at Gunong Pulai, at each end of a great semi-circular valley, to impound the water. The driving job was putting down 2500 lineal feet of 15 in. x 5 in. Steel Sheet Piles, 40 ft. long. The hammers were hung from 2 cranes, and the job was in dense jungle—and the labor was Chinese coolies—and these hammers had to stay whole and entire because there wasn't a repair shop for trackless miles! Needless to say everything was RIGHT—as is usual with McKiernan-Terry Hammers, whether you find 'em on the job "around the corner" or out where the "dawn comes up like thunder." Send for our catalog and find out WHY.

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INSLEY

Roller Bearings for Drum Shafts
Rapid Swing—5 r.p.m.
High Line Speed
Two Travelling Speeds
Separate Control for each Crawler
Direct Connected Clutches

The Insley is made as a full revolving machine, Type "R", and likewise with a 210° swing—Type "C".

Specifications Plus

SPECIFICATIONS are important. Each succeeding year they play a greater part in shovel buying. The Insley has specifications and points of value that rank it second to none.

Of equal importance to the specifications of a shovel is the hidden factor of the knowledge and experience going into a shovel, and the reputation of the manufacturing and distributing organization behind it.

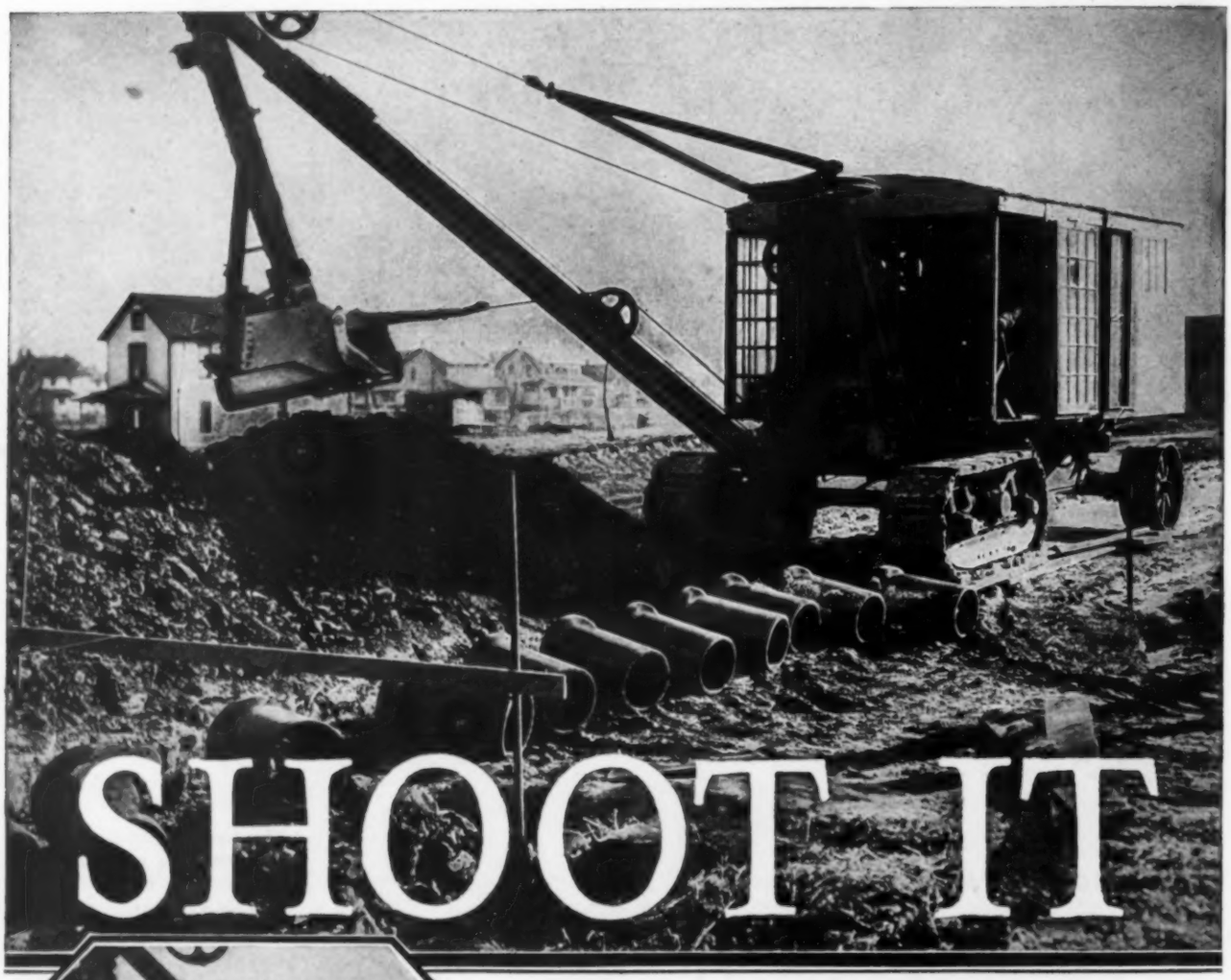
Insley has always had the reputation of making high-grade contractors' equipment, built of the best materials obtainable, sold at a fair price, and of backing this equipment up with service.

Consider this fact when you buy a half-yard shovel. It doesn't appear in the specifications. It does not make an Insley Shovel cost you a dollar more. But it is a far more important point than you can estimate, one which may make the difference between success or failure of a shovel you may own.

INSLEY MFG. COMPANY
INDIANAPOLIS, INDIANA

Division of National Equipment Corporation

721



SHOOT IT

There are two ways of dumping a bucket of dirt. One is to spill it—by inversion. The other is to shoot it through the bottom.

The latter is the quickest, most accurate and generally the most satisfactory method. When dumping into trucks the Keystone Pullscoop with electric trip avoids all spillage. It is a joy to operator and owner.

James Horan of Youngstown is the Contractor on this interesting job. He is laying a ten inch sewer on Dunlop Street. The Keystone is using a 26-inch Pullscoop, cutting a ditch 30 inches wide and 15 feet deep. The operator is Mr. Frank Keely. His thumb is on the contact switch controlling the tripping motor on the "stick."

The insert shows results.

DIGS MORE KEYSTONE FOR A DOLLAR

9-D-52

KEYSTONE DRILLER CO.

BEAVER FALLS, PENNSYLVANIA

170 Broadway, N. Y.—Waukegan, Ill.—Joplin, Missouri

THE new 2 yd. Type 480 shovel carries the accumulated experience gleaned from the large number of Types 37 in severest field service. Heavier and more powerful as is consistent with the larger dipper capacity the Type 480 promises to better the excellent record of its predecessor, the Type 37. It is built in four powers—steam, electric, both rheostatic and Ward-Leonard controls; Diesel-electric.

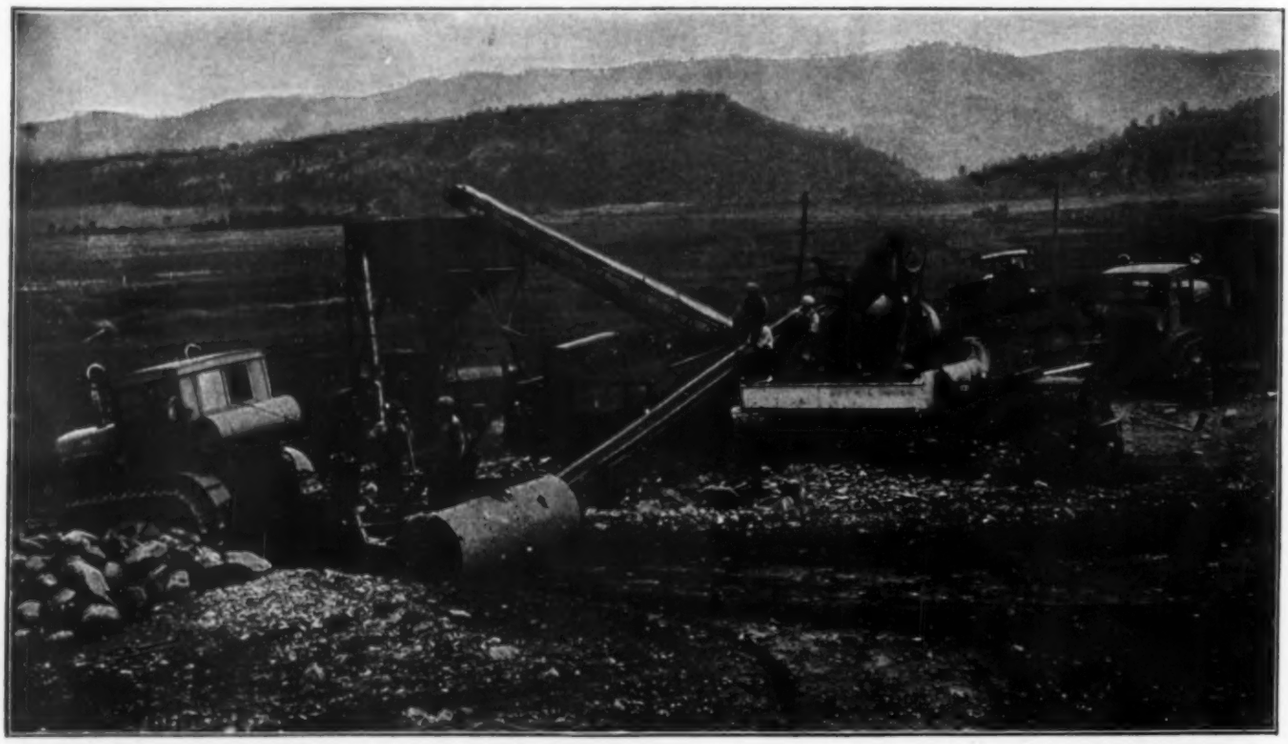
Your bulletin awaits a word from you.

THE MARION STEAM SHOVEL CO.
MARION, OHIO, U. S. A.

MARION

89010

Results ... with a "Caterpillar"



Is the weather bad... the going soft... the load heavy... and are the slopes steep? Turn out a "Caterpillar"—sure of its power, sure of its traction, confident, dependable. It will lick the job whether it is operating a mobile plant, as one of these "Sixtys" is doing, or feeding the conveyor like its mate. And "Caterpillar" track-type tractors stand up. Track parts of heat-treated and hardened steel, bolts of alloy steel—precision machined. No wonder "Caterpillars" do their work "Better, Quicker, Cheaper.

Caterpillar Tractor Co.
EXECUTIVE OFFICES: SAN LEANDRO, CALIFORNIA
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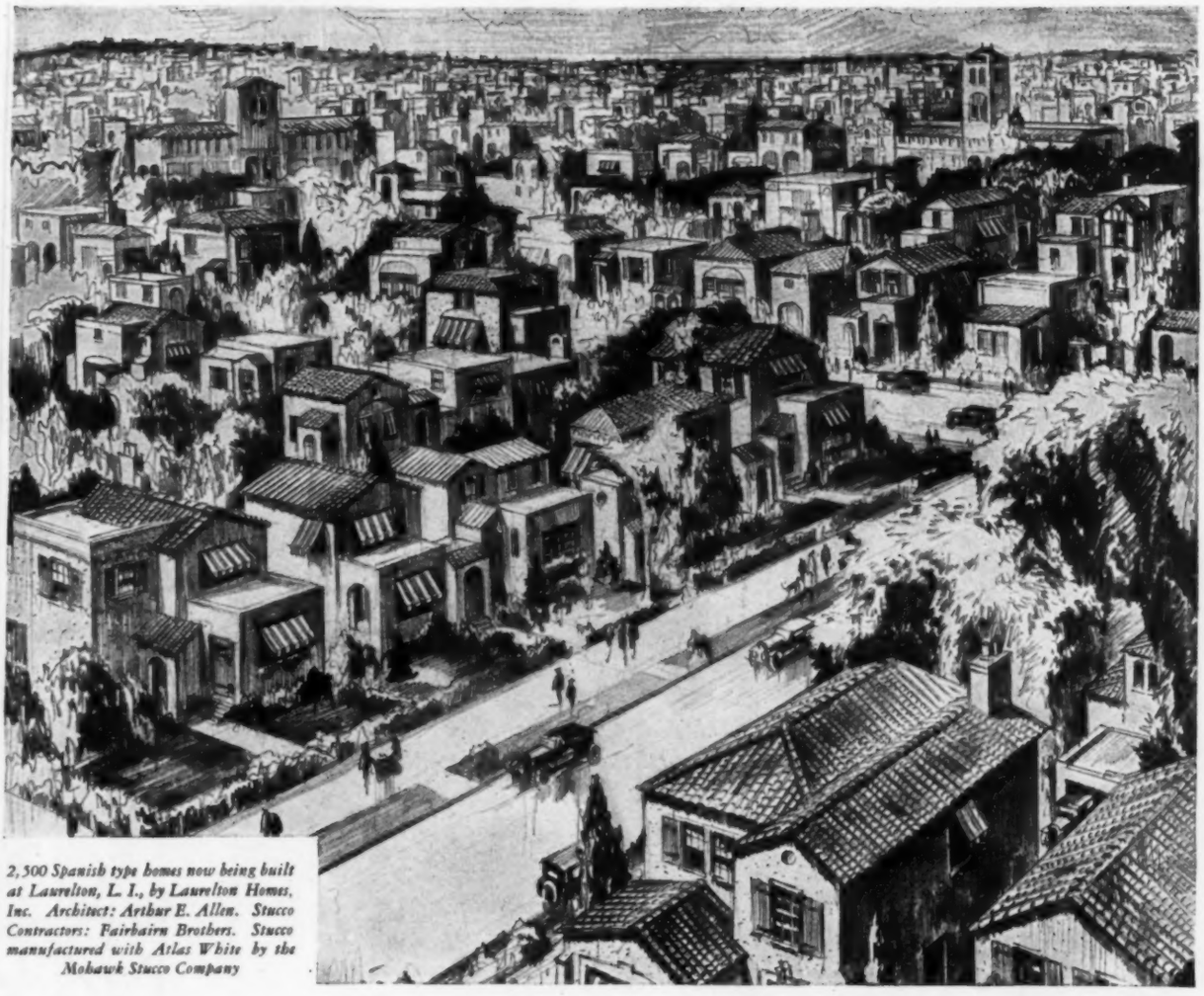
Holt Combined Harvesters · Russell Road Machinery
"Caterpillar" Tractors

CATERPILLAR
REG. U.S. PAT. OFF.
TRACTOR



2,500 Spanish type homes now being built at Laurelton, L. I., by Laurelton Homes, Inc. Architect: Arthur E. Allen. Stucco Contractors: Fairbairn Brothers. Stucco manufactured with Atlas White by the Mohawk Stucco Company

A town sheathed in ATLAS

"What type of houses will please clients and sell fastest?" The importance of that question was multiplied twenty five hundred times at Laurelton, Long Island. And twenty five hundred times the answer was stucco made with Atlas White Portland Cement.

With what wisdom, is evidenced by the fact that over nine hundred homes already completed have been sold and there is a waiting list of purchasers crowding the builders of this notable project.

In addition to beauty in color and design, the homeseeker of moderate means finds in these houses fire-safeness, economy in upkeep, and permanence. The same qualities will add to the desirability and market value of the houses which you build.

° ° °

You can purchase Atlas White or Atlas Gray Portland Cement in any quantity from your own building material dealer. He is the only distributing agency between the Atlas plants and your concrete job. The flexible service which he offers on Atlas and the direct delivery of cement to the user bring Atlas to you at less expense than by any other method. And because he performs this essential, economic service, the dealer makes a vital contribution to the upbuilding of the community.

ATLAS PORTLAND CEMENT

THE ATLAS PORTLAND CEMENT COMPANY, MAIN OFFICES: NEW YORK, ST. LOUIS
BOSTON · ALBANY · PHILADELPHIA · CHICAGO · DES MOINES
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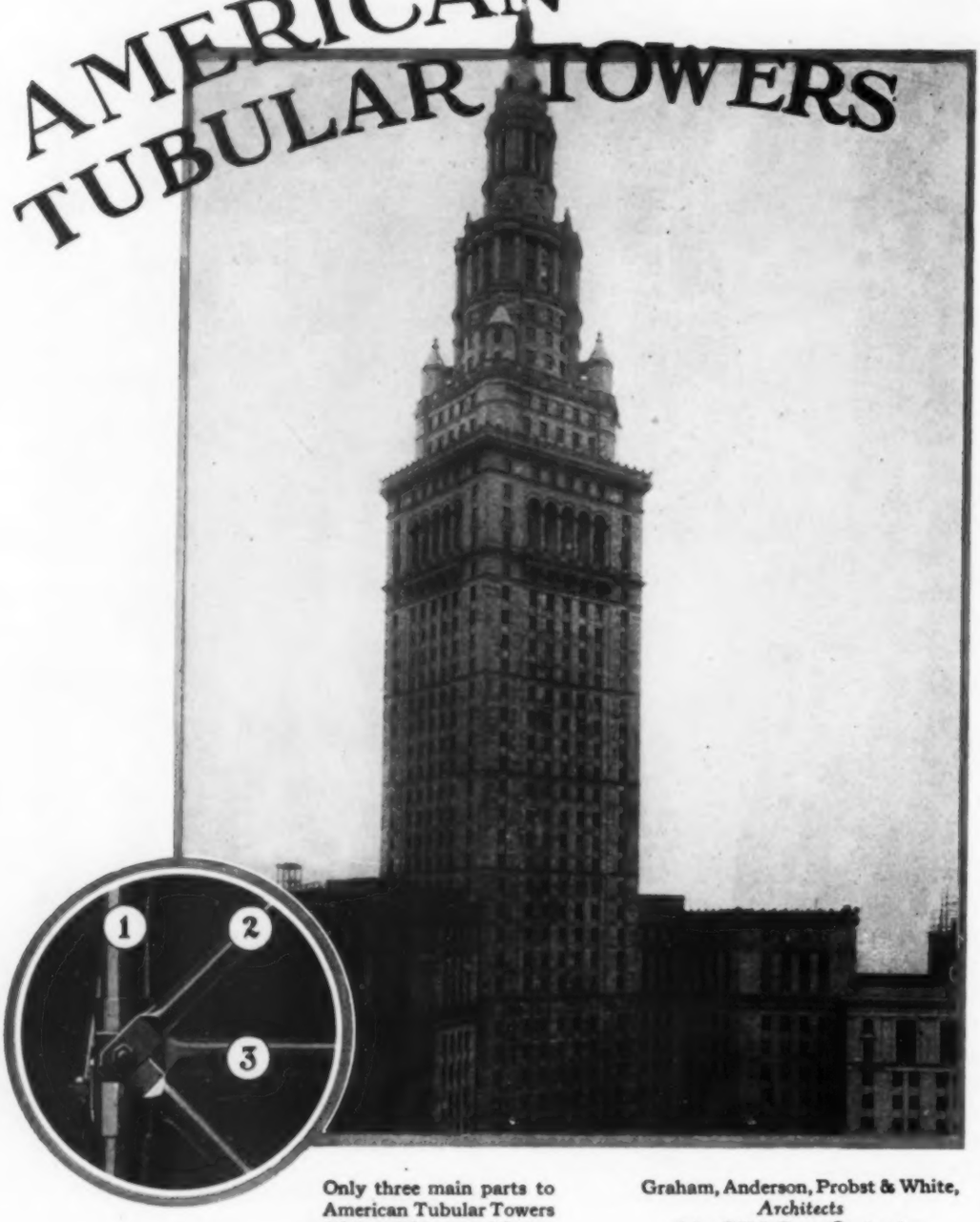
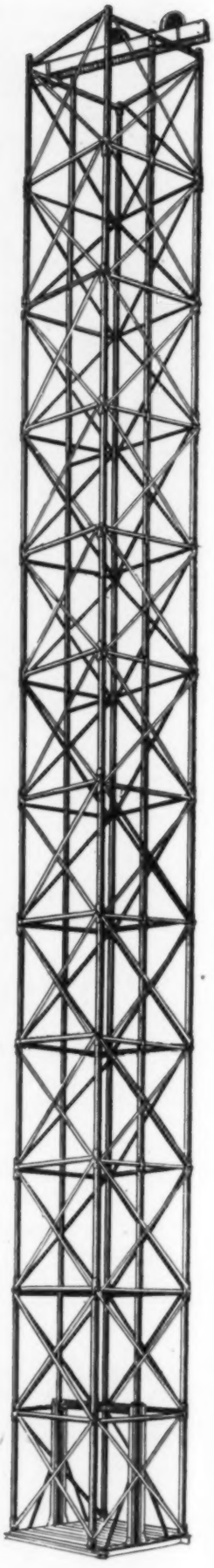
AMERICAN TUBULAR TOWERS



Only three main parts to American Tubular Towers (1) leg; (2) brace; (3) girt.

Graham, Anderson, Probst & White, *Architects*
John Gill & Sons, *Contractors*



In the construction of the Terminal Tower Building, Cleveland, Ohio, two American Tubular Towers were used—one 260 ft. high, one 287 ft. high—for hoisting brick, mortar, tile and miscellaneous materials.

Another recent instance where American Tubular Towers proved dependable for efficient and time-saving service to general and sub-contractors during building construction. Write for details. Towers for Sale or Lease.

DRAVO EQUIPMENT COMPANY
GENERAL OFFICES · PITTSBURGH · PA ·
NEW YORK CHICAGO PHILADELPHIA CLEVELAND
DISTRIBUTORS IN PRINCIPAL CITIES

A Dependable Guaranteed

Single Wheelbarrow Elevator Hoist

Model 15-20

$520

F. O. B. FACTORY

See These Features

2 Cylinder—8 H.P. LeRoi Engine.
1500 Pounds Capacity.
125 Feet Per Minute Speed.
Bronze Bushings.
Ball Thrust Bearings.
Husky Machine Cut Gears.
Asbestos Lined Cone and Brake.
Alemite High Pressure Lubrication.
Electric Welded Steel Skids.
$520 F.O.B. Factory.

Equipped with 4 Cylinder, 12 H.P. LeRoi —rating 1500 Pounds at 175 Feet Per Minute at $570, F.O.B. Factory.

A husky, dependable little hoist that will pay for itself on one fair size job!

Equally well suited to play the part of "Handy Andy" around big projects.

Of the same standardized design and construction as other sizes ranging from 4 to 50 Horsepower—backed by 24 years' hoist building experience.

In stock ready for shipment on your wire order.

Catalog N and valuable Hoist Manual upon request.

THE BROWN CLUTCH CO., Sandusky, Ohio, U. S. A.

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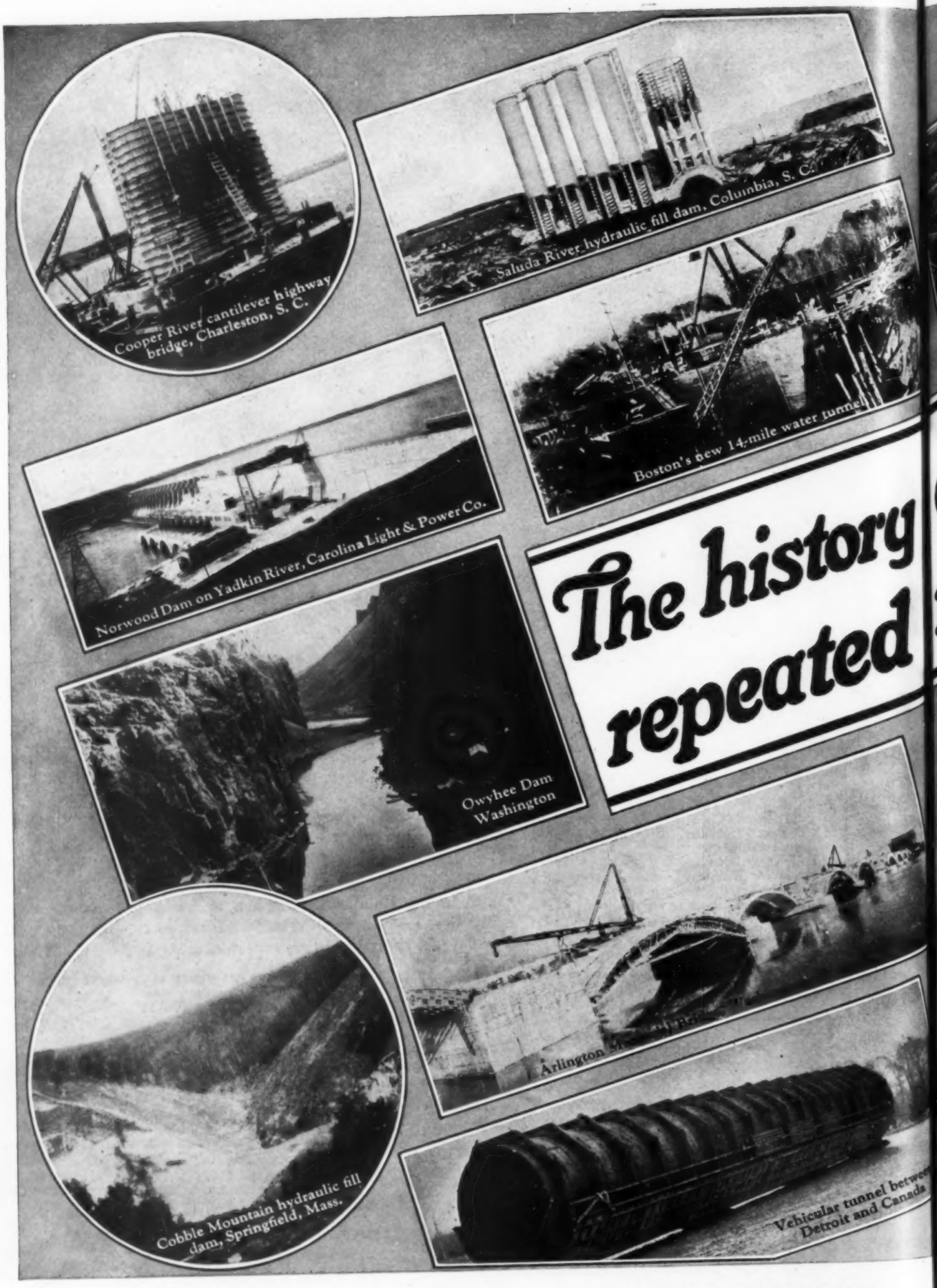
SINGLE & MULTIPLE DRUM – REVERSIBLE

GIANT-LINE

NON-REVERSIBLE AND CONVEYOR TYPES

HOISTS

HOIST SPECIALISTS FOR 24 YEARS


Cooper River cantilever highway bridge, Charleston, S. C.
Saluda River hydraulic fill dam, Columbia, S. C.
Boston's new 14-mile water tunnel
Norwood Dam on Yadkin River, Carolina Light & Power Co.
The history repeated
Owyhee Dam Washington
Arlington
Cobble Mountain hydraulic fill dam, Springfield, Mass.
Vehicular tunnel betwee Detroit and Canada

The nationally-known highway through Mercer County, N. J. . . . permanently wrinkle-proofed with transverse and longitudinal installations of Carey Elastite Expansion Joint.

This road *of scenic grandeur* is as smooth as a table top!

It parallels the Delaware River, this rolling ribbon of white concrete. Through the heart of Mercer County into Trenton, New Jersey — an always-remembered highway that is smooth, smooth, smooth.

Lastingly smooth, because, as you have surmised, it is lastingly protected by Carey Elastite Expansion Joint. Transverse installations, longitudinal strips—weather-proof protection that is complete.

Certainly you must know more about Carey Elastite Expansion Joint. How it makes concrete secure against climatic changes—why we are shipping it from coast to coast, in increasing tonnage, month after month. Shall we send you our illustrated booklet?

Carey Elastite EXPANSION JOINT

THE PHILIP CAREY COMPANY, *Lockland,* CINCINNATI, OHIO

"We are saving at least 50%"

in cost of production

Newton County Stone Company

QUALITY FIRST—SERVICE ALWAYS

Crushed Stone
Agricultural Limestone

KENTLAND, INDIANA

The Fate-Root-Heath Co.,
Plymouth, Ohio.

Gentlemen:

We purchased one of your 8 ton Plymouth Locomotives April 30, 1926 and have had practically no trouble with it.

We like it much better than steam as it is always ready to go at a moments notice and requires no one to get up steam an hour or two before time to go to work.

We are saving at least 50 per cent in cost of operation, this saving does not include the use of a hoist to pull our loads up the grade a considerable part of the time when using steam. This is not necessary when using the Plymouth.

We are more than pleased with its operation and the service you have rendered.

Yours very truly,
NEWTON COUNTY STONE COMPANY
Geo. H. Hart Sec-Treas.

This statement is a quotation from Mr. George H. Hart's letter reproduced here.

Newton County Stone Company has a haulage problem requiring a one thousand foot track with a four percent grade and sharp curves. The gross load using five cars is thirty-five thousand pounds.

Their Eight Ton Plymouth Gasoline Locomotive is delivering six hundred net tons of stone each ten hour day on only fifteen gallons of gasoline.

Read Mr. Hart's letter then write us your problem and ask us for our bulletins. There's a saving for you too.

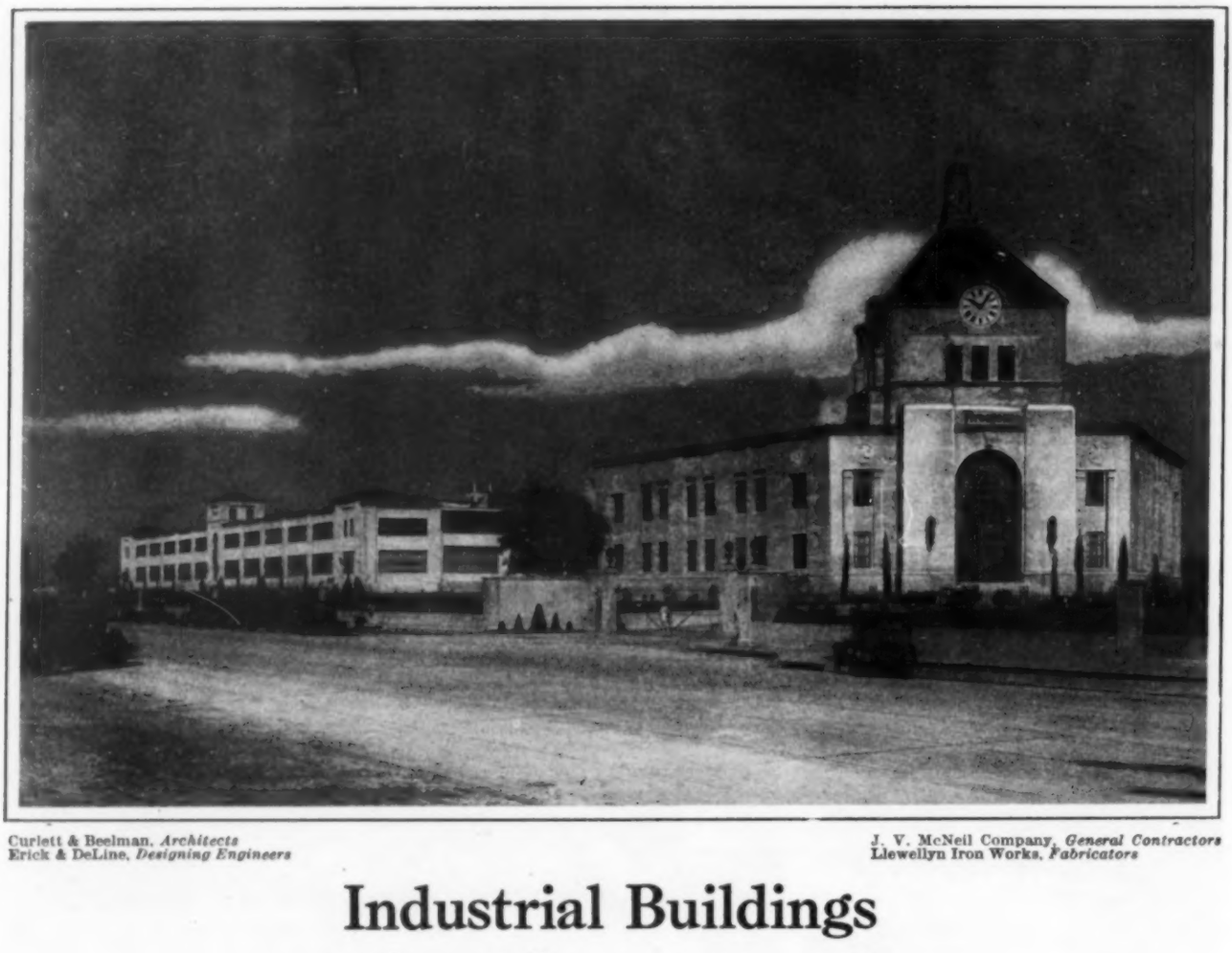
When you pay the price of a Plymouth for a Locomotive you deserve PLYMOUTH QUALITY.

PLYMOUTH LOCOMOTIVE WORKS
The Fate-Root-Heath Company
299 Riggs Avenue, PLYMOUTH, OHIO

The PLYMOUTH LINE OF GASOLINE AND DIESEL LOCOMOTIVES IS COMPLETE FROM 2 TON TO 50 TON SIZES

PLYMOUTH

Gasoline and Diesel Locomotives



Curlett & Beelman, *Architects*
Erick & DeLine, *Designing Engineers*

J. V. McNeil Company, *General Contractors*
Llewellyn Iron Works, *Fabricators*

Industrial Buildings need not be unattractive

Good architecture is the result, not of costly ornamentation, but of proper proportion and correct emphasis of masses and voids. Manufacturers have only recently come to realize the advantages of attractive, well planned, correctly lighted and ventilated industrial buildings. Not only does the building reflect the character of the organization which it houses, but also affects the efficiency of the workers. The cost of proper construction is little, if any, in excess of that of unattractive, inefficient buildings.

The Firestone Tire and Rubber Company may justly feel proud of their plant at Los Angeles, pictured above. Carnegie Steel Company also takes pride in the fact that Carnegie Beam Sections were used in its construction, selected because these new sections are particularly adaptable to the construction of industrial buildings.

A unique feature of Carnegie Beams is their wide, parallel flanges. Eight surfaces for connections are thus provided instead of four, simplifying very markedly the great variety of connections usually required in industrial buildings. For long, heavily loaded spans, a complete range of beams of high section modulus is offered which reduce obstructive columns to a minimum; and for long, unbraced column lengths there are included in the series sections designed to give a maximum least-radius-of-gyration combined with minimum weight.

Neatness of construction and simplicity of detail characterize jobs fabricated of Carnegie Beams. These new sections merit your investigation. Write for descriptive handbook — "Carnegie Beam Sections".

1971

CARNEGIE STEEL COMPANY

Subsidiary of **UNITED STATES STEEL CORPORATION**

CARNEGIE BUILDING ··· *PITTSBURGH, PA.*

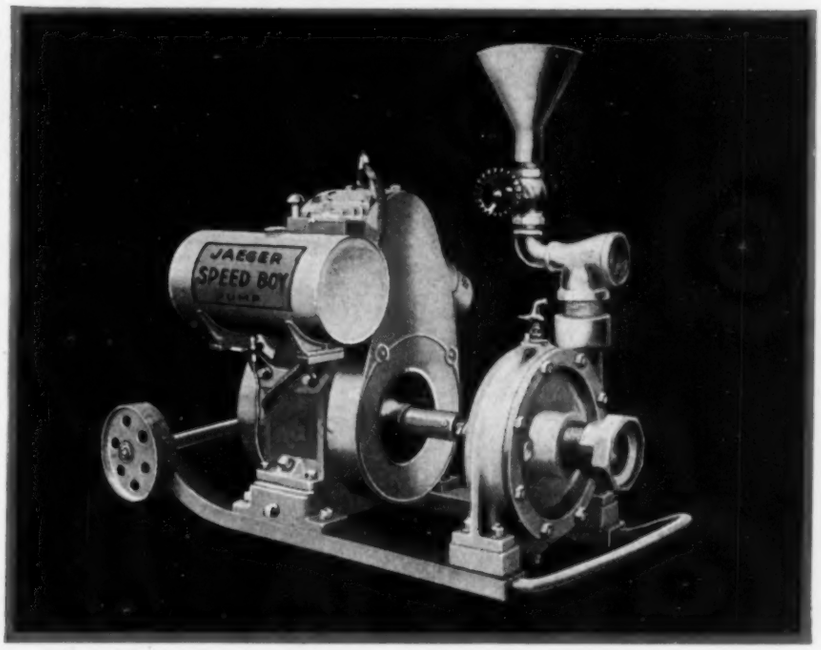
Jaeger's *SPEED BOY* *PUMP*

Handles 8,000 Gallons per Hr. 25% to 28% Solids--1 Man Moves It

$167.50

CASH F. O. B. FACTORY
ADD FREIGHT

Built for steady, heavy duty...yet 2 boys carry it



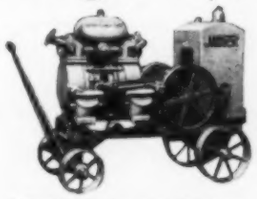
The Greatest Pump Ever Offered!

HERE'S the biggest news that ever broke on pumps...a 2 h.p., 4 cycle, high speed engine, with foot starter, direct coupled with a *real, non-clogging, big volume* pump, and priced at $167.50. Jaeger open type brass impeller won't rust or stick, handles 25% to 28% solids (sand, mud, gravel). Pump handles like a wheelbarrow...picks up and rides in your car.

No gallons wasted with priming devices. Instead we furnish simple, easy primer and foot valve free and give you 8,000 gallons per hour in the pump. Briggs & Stratton engine is air-cooled, light weight, good for years of heavy pumping. Send for catalog today.

Perfect portability--- one man moves it around.

Jaeger Builds All Sizes---All Types



High capacity, non-clogging diaphragm pumps.

WHATEVER your requirements, Jaeger builds a pump that will handle your water supply, excavation, sump operation etc. dependably and at low cost. Diaphragm, piston and centrifugal types... capacities up to 1800 gal. per minute... featured by ruggedness, accessibility, high pumping efficiency and freedom from clogging.

Lift and Force Trench Pumps.

JAEGER MIXERS TRAILERS PRICED $169 up
TILTERS, NON-TILTERS, PLASTER MIXERS

WRITE for CATALOG

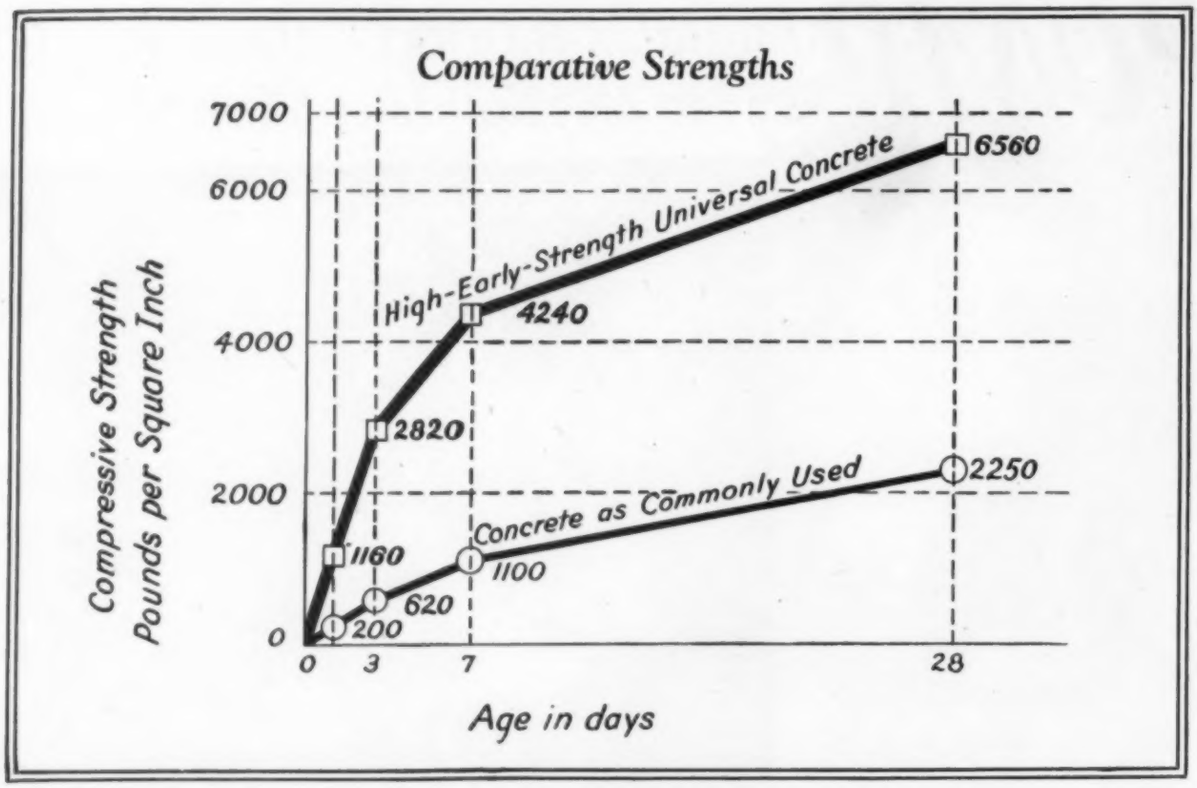
THE JAEGER MACHINE COMPANY
800 Dublin Avenue, Columbus, Ohio

Send me, by first mail, complete description of the SPEED BOY and line of Jaeger pumps with prices.

Name_____

Address_____

A Good Thing to Remember



Send the coupon for your copies

Name _____

Address _____

Universal Portland Cement Co.
203 So. La Salle Street, Chicago

Without obligation, please send me the following booklet:

☐ High-Early-Strength Concrete
☐ General Building Edition
☐ Paving Edition

CM 5-29

When You Get One, You Get All Three

1. *Strong concrete in 3 days*

With the usual materials, usual equipment, usual labor and usual Universal cement, you can secure at 3 *days* concrete that is stronger than ordinary concrete at 28 *days*.

2. *Permanently stronger concrete*

As shown in the graph above, *High-Early-Strength Universal* Concrete not only has a high 3-day strength but is *permanently* stronger than concrete as ordinarily mixed and placed.

3. *Denser and more durable concrete*

In addition, the methods by which *High-Early-Strength Universal* Concrete is obtained produce a denser and more durable concrete.

Description of methods for securing on the job strengths comparable with those shown in the graph (see above) will be sent on request. Mail the coupon for either or both of the booklets shown at the left. They contain information you will want to keep in mind.

One Standard Cement for All Concretes and Mortars

Universal Portland Cement Co.

Subsidiary of United States Steel Corporation

Chicago Pittsburgh Minneapolis Duluth Cleveland Columbus New York

Concrete for Permanence

Construction Methods

McGRAW-HILL PUBLISHING COMPANY, INC.
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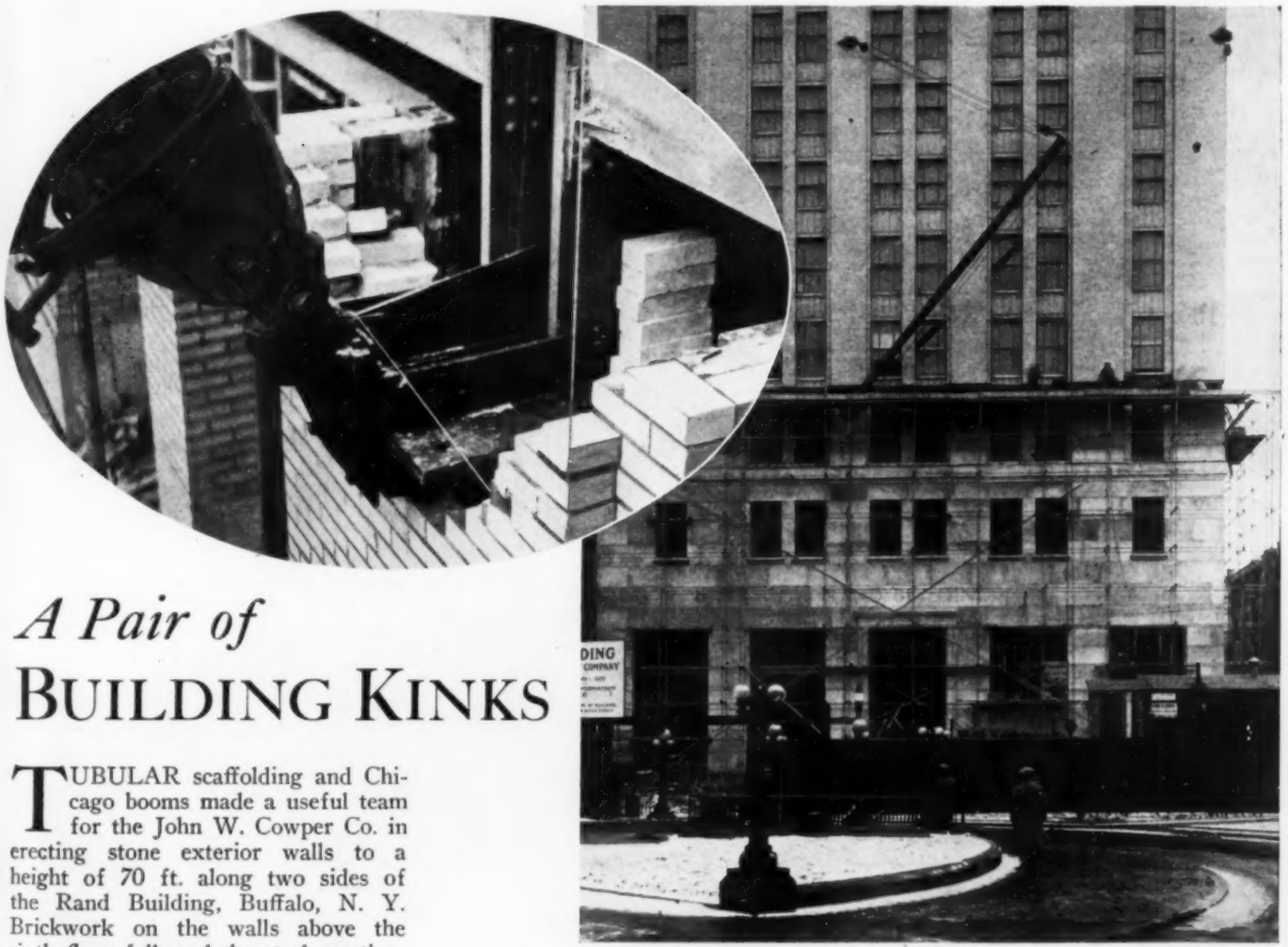
A monthly pictorial of field practice and equipment illustrating successful construction, maintenance and material-handling methods for general construction, highways, buildings, industrial plants and public works and utilities

ROBERT K. TOMLIN, *Editor*

WILLARD CHEVALIER
Publishing Director

VOLUME 11 | NEW YORK, MAY, 1929 | NUMBER 5



A Pair of BUILDING KINKS

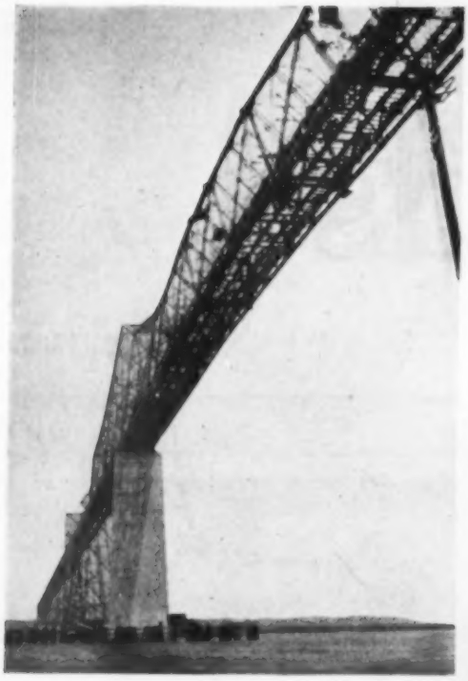
TUBULAR scaffolding and Chicago booms made a useful team for the John W. Cowper Co. in erecting stone exterior walls to a height of 70 ft. along two sides of the Rand Building, Buffalo, N. Y. Brickwork on the walls above the sixth floor followed the steel erection, the brick masons working on a suspended scaffold. Below the brickwork three Chicago booms made up from 12x12-in. fir timbers 54 ft. long were erected on steel outside columns with their foot blocks somewhat above the sixth floor line. Double-drum hoists to operate the booms were placed in the basement, where the operators received bell signals from men on the ground directing the stone setting. The hoists were driven by 25-hp., d.c. electric motors.

The booms raised and set stones weighing up to 10 tons. There was found to be very little distortion in the sticks while they were handling the heaviest stones.

Pipe scaffolding was used up to the top of the stonework in order that the booms might at all times be working in the clear. This scaffold covered a total length of 230 ft. of sidewalk. It was manufactured by the Patent Scaffolding Co. and was erected to a height of 70 ft. D. B. Niederlander, general superintendent for John W. Cowper Co., Buffalo, states that the tubular scaffolding used gave very gratifying results, as it was erected rapidly, presented a neat appearance, eliminated danger of fire, and was easily dismantled. The time for dismantling was approximately 3 days, and both costs and time of erection and dismantling compared favorably with the records for wood scaffold.

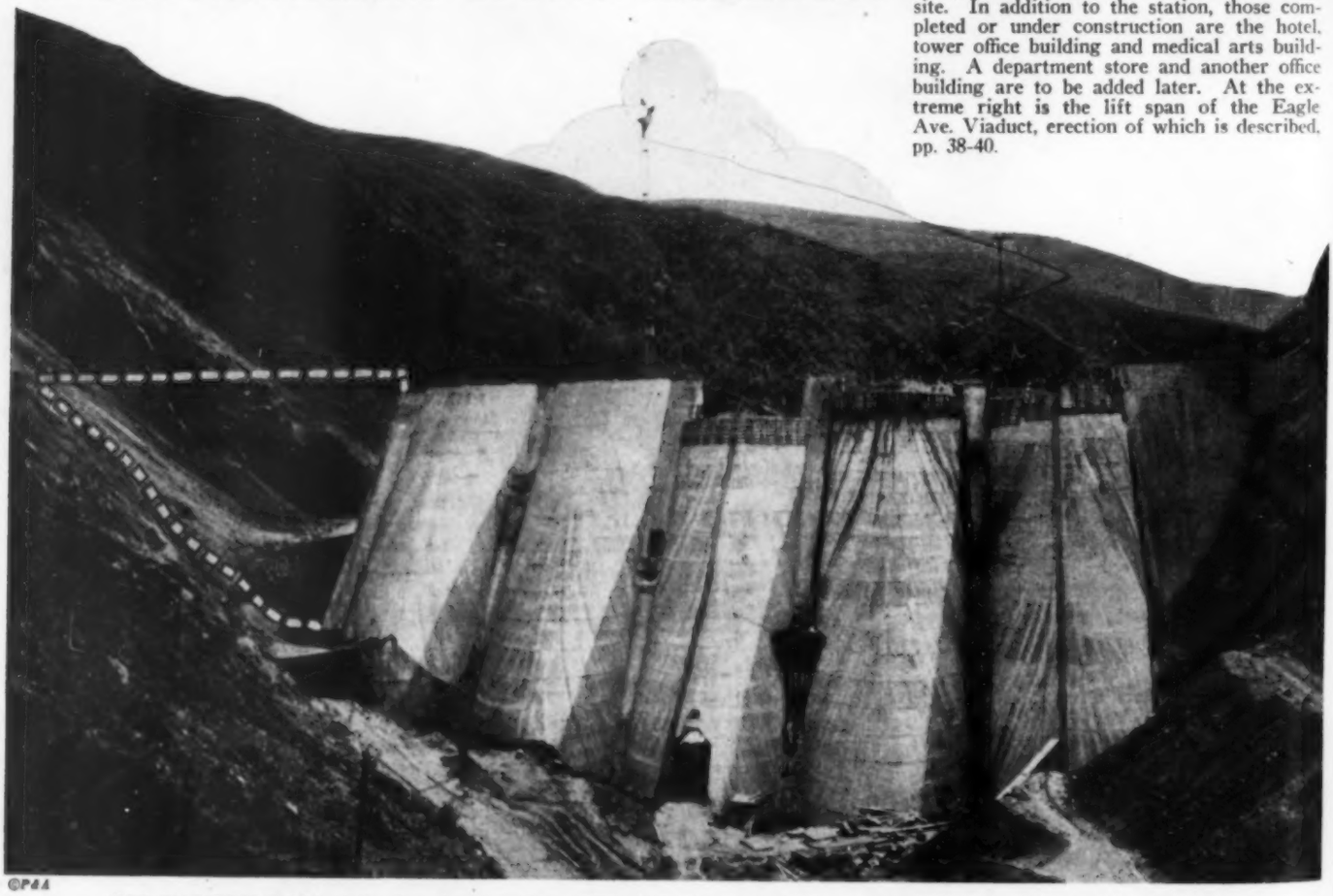
TO SET STONE in exterior walls of lower floors, the contractor makes use of Chicago booms erected on the steel outside columns. Tubular scaffolding is erected to the height of the stonework. (*In oval*) BRACKET supporting boom seat.

This Month's



CANTILEVER TRUSS SPAN 640 ft. long over Town Creek has been completed on the Cooper River bridge, Charleston, S. C. It is part of a toll bridge project 14,000 ft. long, with a main cantilever span over Cooper River 1,050 ft. in length. Waddell & Hardesty, New York City, are the engineers. The Foundation Co., New York, built the piers and the McClintic-Marshall Co., Pittsburgh, is erecting the steel trusses.

CLEVELAND UNION PASSENGER TERMINAL is to be ready for service January, 1930. Tracks of three railroads and of the rapid transit lines enter the depot on a level 34 ft. below the streets which cross the area on viaducts. The quantities involved in the construction below street level include 3,000,000 yd. of excavation, 400,000 yd. of concrete, 15,000 tons of reinforcing steel, 50,000 tons of structural steel, 42 miles of track, and 450,000 sq.ft. of platforms. A group of buildings rises above the 35-acre site. In addition to the station, those completed or under construction are the hotel, tower office building and medical arts building. A department store and another office building are to be added later. At the extreme right is the lift span of the Eagle Ave. Viaduct, erection of which is described, pp. 38-40.

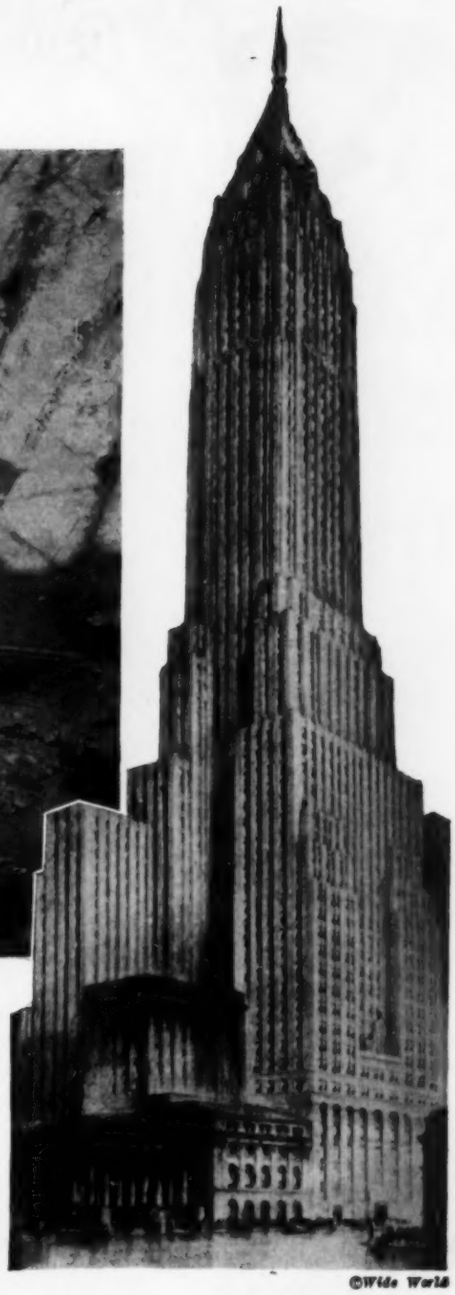


©P&A

BIG DALTON DAM of the Los Angeles County Flood Control District is nearing completion. Dotted line indicates outline of unfinished east end of structure. The dam, which is of gravity arch type, is being built by H. W. Rohl, Los Angeles, under the supervision of Chief Engineer E. C. Eaton. The contractor left an aperture in the base at the center of the dam for passage of motor trucks.

"News Reel"

GIBSON DAM (*above*) on the Bureau of Reclamation's Sun River Project, Montana, will be completed this spring. The dam is a concrete arch 205 ft. high, with a crest length of 882 ft. and a volume of 160,000 cu.yd. It is being built by the Utah Construction Co., Ogden, Utah. The reservoir will have a capacity of 105,000 acre-ft.



©Wide World

TALLEST BUILDING (*right*) laurels pass to projected Bank of Manhattan Building which is to rise more than 63 stories to a height of 840 ft. above Wall Street, New York City. Starrett Bros. were awarded the general contract by the owner, the Thirty-Six Wall Street Corporation. H. Craig Severance, Inc., is the architect.

Wanted: Photos From *Your* Job

On *your* job there may be either professional or amateur photographers who are making a picture record of the work.

Remember that the Editor of "Construction Methods" (Tenth Ave. at 36 St., New York) is always on the lookout for *pictures with a purpose*—photos that tell a real job story or illustrate some effective detail or time-saving "kink." Read the hints on picture-taking on page 1 of this issue and forward prints of your best negatives. Payment, of course, for those acceptable for publication.

MT. HOPE BRIDGE, across an arm of Narragansett Bay 15 miles south of Providence, R. I., had been completed to the point of placing the concrete floor when breaks in the wires of cable strands at the strand shoes of both anchorages caused Robinson & Steinman, the engineers for the Mt. Hope Bridge Co., to stop the work and to order dismantling of the bridge. The cables of heat-treated wire with a high yield point, which had been substituted for the cold-drawn wire originally designated in order to gain the advantage of a 10 per cent higher factor of safety, will be replaced with cables of the usual cold-drawn wire.

M. B. MARKLAND, contractor, of Atlantic City, N. J., who built the big Convention Hall.

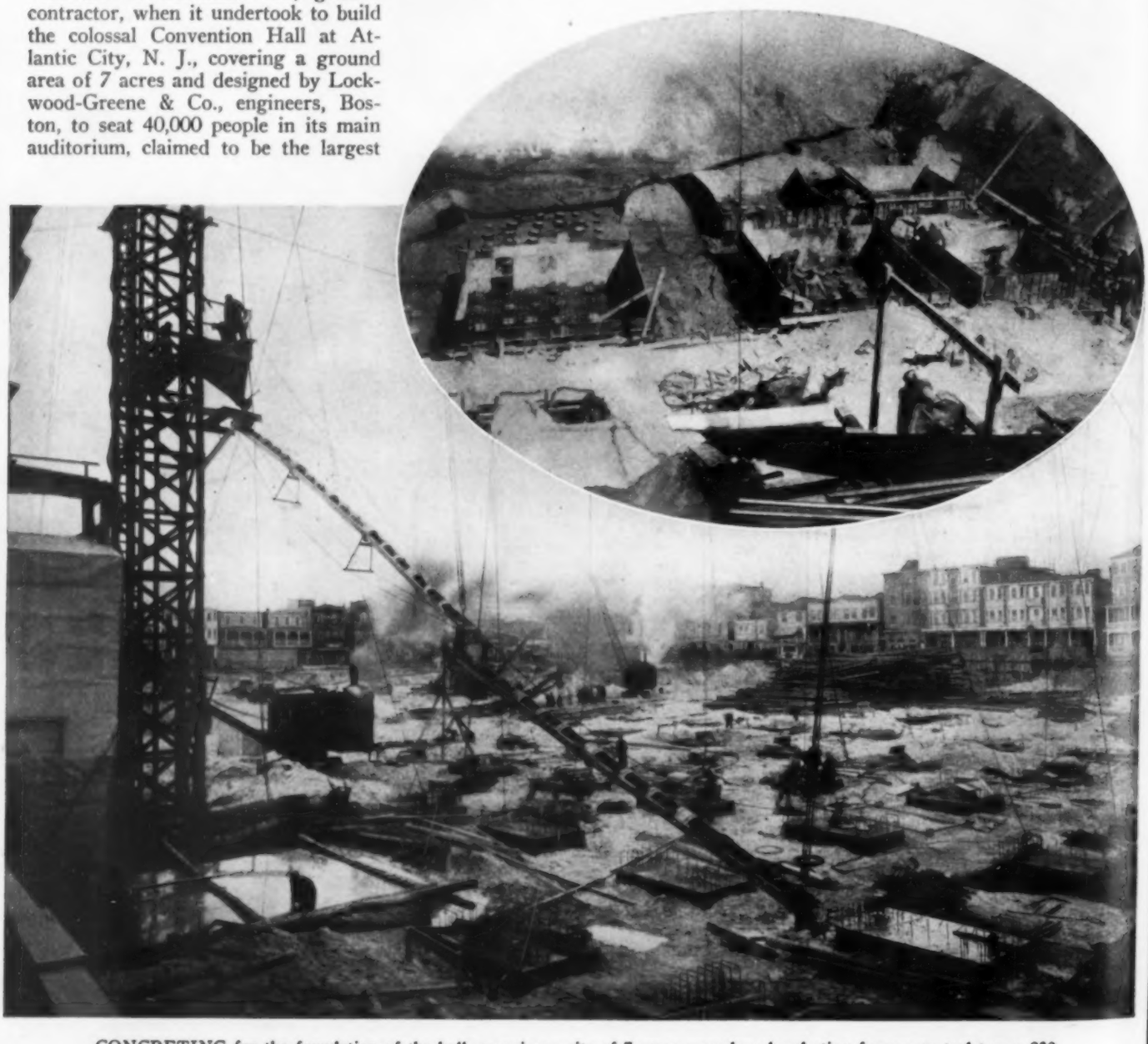
From 124-Ft. Towers Contractor Erects

HUGE TRUSSES

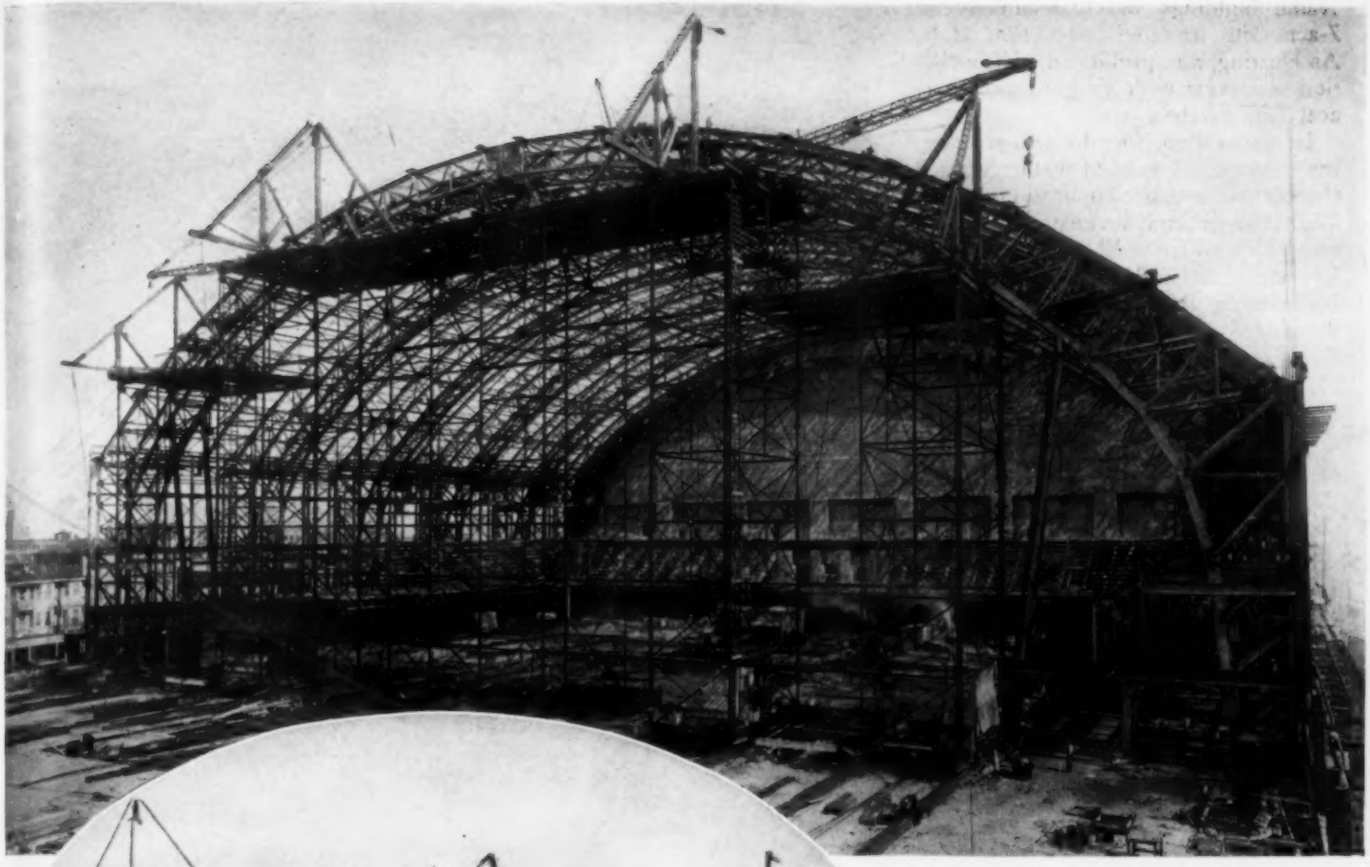
for Atlantic City Convention Hall

TWO construction problems of major importance faced the M. B. Markland Co., general contractor, when it undertook to build the colossal Convention Hall at Atlantic City, N. J., covering a ground area of 7 acres and designed by Lockwood-Greene & Co., engineers, Boston, to seat 40,000 people in its main auditorium, claimed to be the largest of its type in the world. The first of these problems was to provide an adequate substructure in water-bearing sand only a few hundred feet from the ocean front, the lowest point of the excavation (for the boiler room) being about 40 ft. below mean high water. The second big task was to erect ten pairs of three-hinged pin-connected steel trusses (clear span 334 ft. and rise 136 ft.). Each pair of trusses weighed 220 tons.

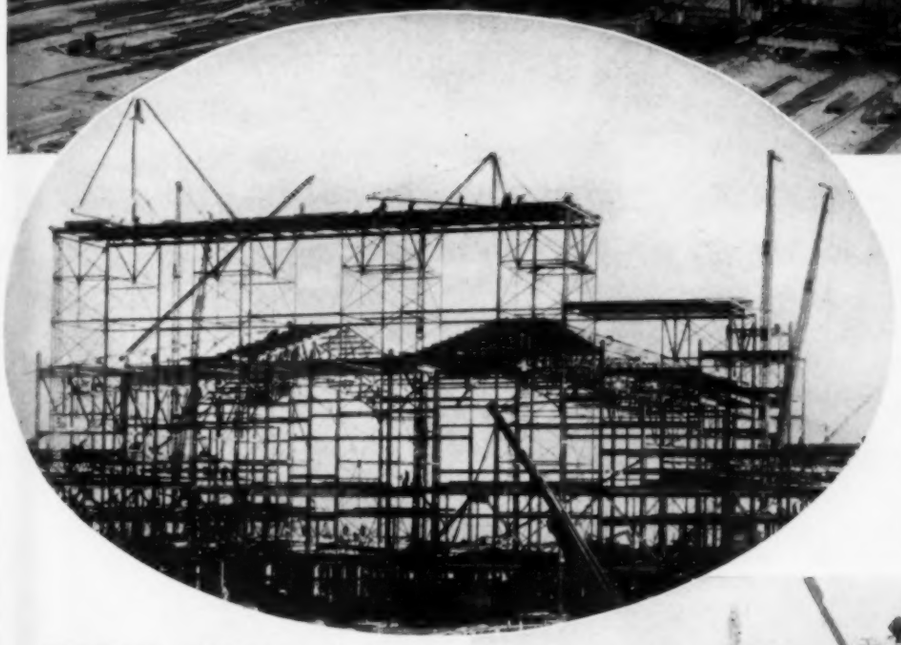
Design—Fronting on the boardwalk along the ocean, the building is 350 ft. wide and 662½ ft. long, occupying an entire block. The main auditorium is 350x450 ft. in plan, with an additional smaller hall 130x185 ft. on the second floor of the head house. A basement extends under the entire



CONCRETING for the foundation of the hall, covering a site of 7 acres, was done by chuting from a central tower 232 ft. high. (*In Oval*) FORMS in place around pile clusters which were jetted down and driven with hammer to carry piers for steel columns.



ROOF TRUSSES for auditorium, to seat 40,000 people, have spans of 334 ft. They are placed in ten pairs, and weigh 220 tons per pair. Ties for trusses form part of floor framing. Trusses are three-hinged, pin-connected type.



ERECTION TOWERS (*above*) for steel trusses provided working platforms 124 ft. above ground floor level. They carried four derricks for handling steel.

area, with a boiler room 15 ft. below basement floor level.

The main feature of the superstructure is the ten pairs of huge steel trusses of Carnegie beam sections supporting the auditorium roof. Chord members are of a tee section with an 18-in. stem plate, two 8x8-in. angles and one or more 18-in. flange plates. The curved shape of each truss is formed by straight members changing direction at alternate panel points, where splices occur.

Concrete piers, 4x8 ft. in section and 20 ft. deep, carry cast-steel pedestal supports for the roof trusses. Ties for the bottoms of the trusses form part of the first floor framing. Truss pin diameters are 7 in. at the crown and 8½ in. at the bottom points.

Unwatering Excavation—The contractor's first work was to demolish existing reinforced-concrete and steel-

CAST STEEL BASES (*at left*) on concrete piers are ready to receive footings of pin-connected trusses. Lackawanna sheet piling is being pulled (*on right*) with steam hammers.

frame buildings which occupied the 7-acre site for the Convention Hall. As blasting was prohibited, the operation was done with air guns and oxy-acetylene torches.

In excavating for the substructure the presence of ground water close to the surface was a complicating factor. With the ground surface at El.+10, mean high water at El.+3.5, and mean low water at El. 0, excavation for the boiler-room floor had to be carried down to as much as 40 ft. below high water level. During storms, however, water elevation in the ocean reaches El.+10.

EXCAVATION IN THE DRY was made possible by well points. Work is starting on the jetting of piles for the foundation. About 20,000 piles were placed.

TRAVELER with four booms speeded up the operation of jetting piles into sand with 2-in. water stream under 60-lb. pressure. Progress was 400 piles per working day.

To cope with this difficult condition of sub-surface water the Markland organization installed a well-point system covering the entire site. It involved a total of 40,000 lin.ft. of 2 to 10-in. pipe, including 2,000 ft. of main 6-in. header pipe around the four sides of the block, 20,000 ft. of secondary 3-in. line, 2-in. well point risers, and 4 to 6-in. pump discharge lines. For the deepest parts of the foundation two and sometimes three levels of well pointing were necessary.

Pumping equipment included six Worthington horizontal duplex, double-acting piston pumps, each with a capacity of 800 gal. per minute and, for the deepest points, additional Goulds pumps. Commenting on the water problem, Mr. Markland said: "It was necessary to unwater the entire site and keep it dry until the completion of the foundations. The ground is composed of fine sand and thin strata of clay. High tide in the ocean is within 300 ft. of the site and water runs through the sand at the rate of 4 ft. per minute."

20,000 Pites—For the substructure

STEAM HAMMER (*below*) drove 30-ft. piles down the last 2 ft. after jetting.

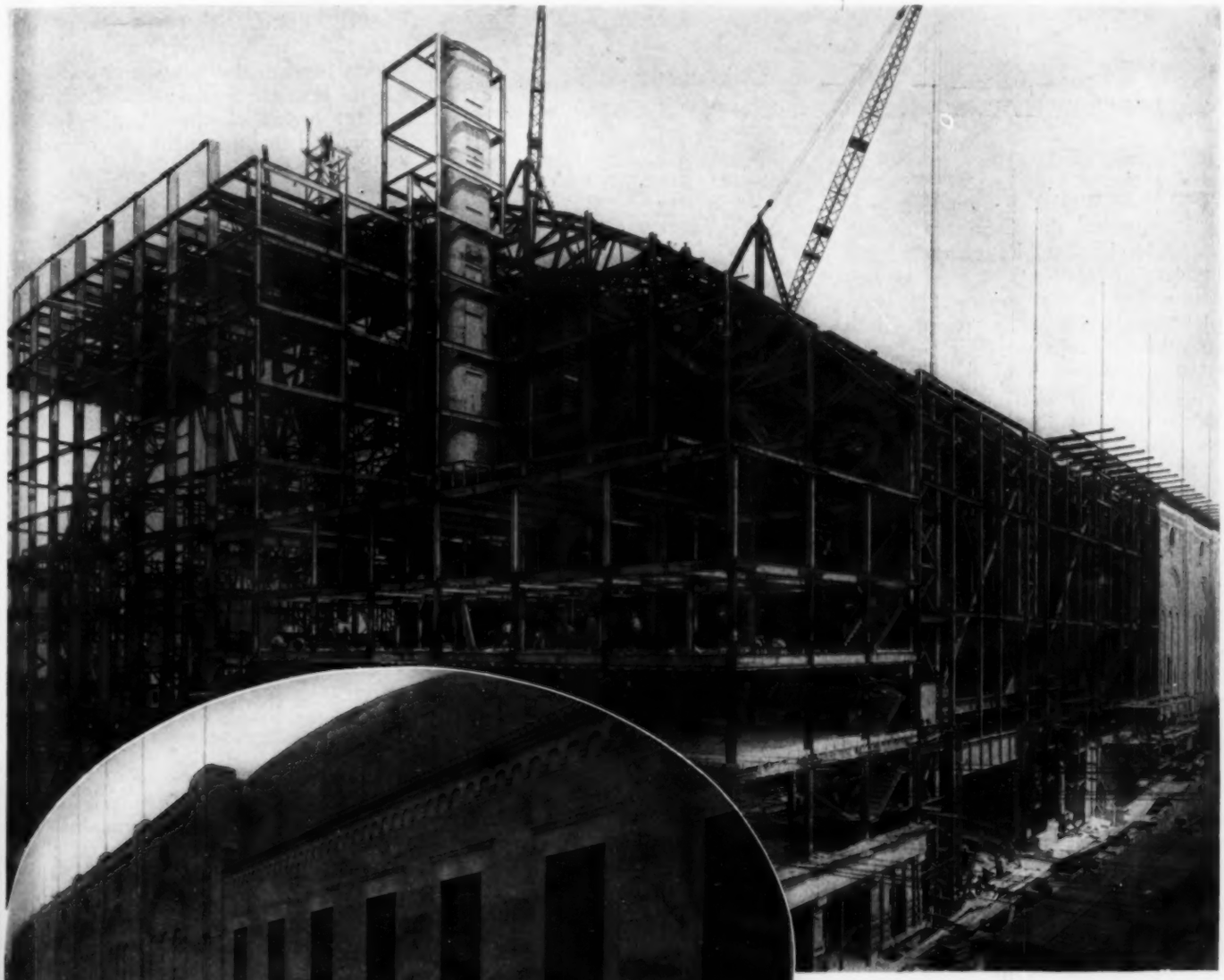
the contractor placed about 20,000 piles, averaging about 30 ft. in length and with minimum butts of 12 in. The practice followed was to jet piles with a 2-in. stream of water under 60-lb. pressure to within 2 ft. of their final position and, after allowing a day or so for the sand to settle around them, to drive the final 2 ft. with McKiernan-Terry steam hammers operated from Erie and Bucyrus cranes. For the jetting operations the contractor developed a 4-boom traveler, shown in one of the pictures.

Waterproofing was applied to the entire concrete beam-and-slab basement structure. For the boiler-room floor, to resist hydrostatic pressure, a concrete slab 7 ft. thick was poured. Concrete for the foundations, involving 28,000 cu.yd., was poured from a central tower 232 ft. high.

On the steelwork the feature was the use of six erection towers for the ten pairs of heavy trusses, with spans of 334 ft., for the main auditorium. Platform elevations on the tallest towers were 124 ft. above floor level. Trusses were assembled in place in 24-ft. lengths and bracing was connected as work progressed. They were completely riveted to within eight panel points of the crown pins, the remainder being half-bolted and half-pinned. All bracing was bolted before the erection towers were removed.

The two trusses of each pier are spaced 10 ft. on centers and the pairs are spaced on 49 ft. 2-in. centers.

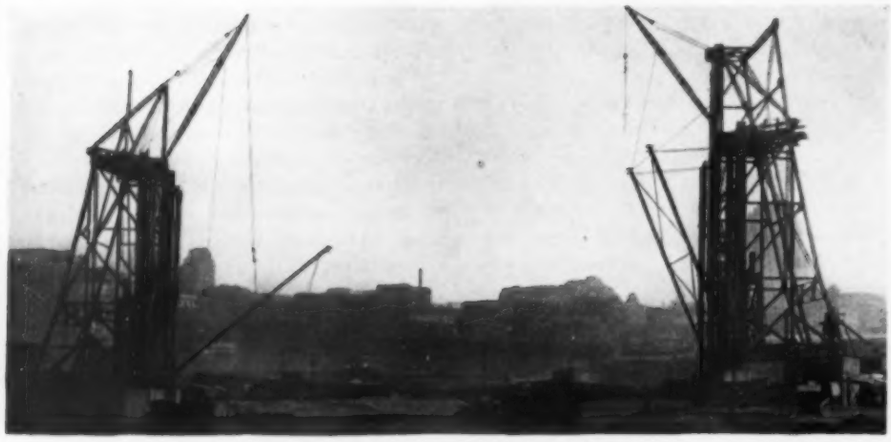
With the Lockwood-Greene organization, Cook & Blount served as associate architects, and Alexander H. Nelson, of Atlantic City, as associate engineer. For the M. B. Markland Company, contractor, M. B. Markland, president, was in general charge of construction.



STEELWORK (*above*) completed: The immense structure is roofed with a 3-in. solid gypsum slab.

EXTERIOR WALLS (*left*) are of Indiana limestone backed with 8-in. of solid brick and 4-in. of hollow brick supported on steel frame.

Steel Erectors Span Busy LIMITED



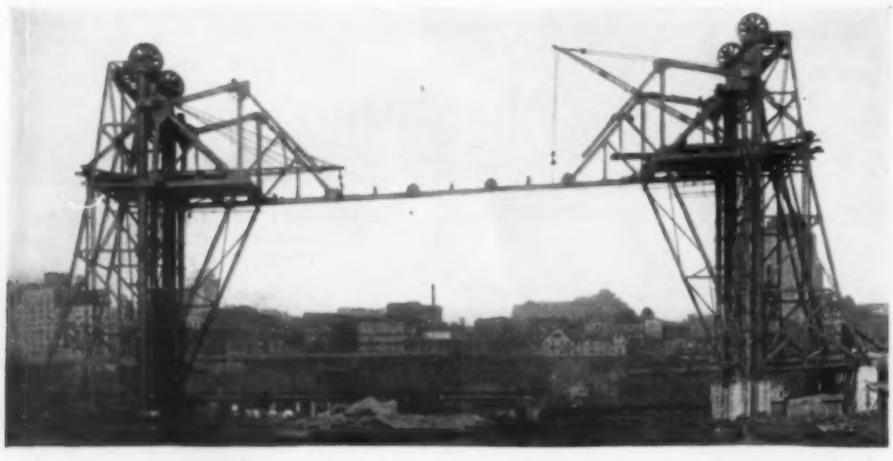
DERRICKS PLACED ON TOWERS at the 84-ft. level erect steel bents on the front columns.

FALSEWORK limitations in spanning the Cuyahoga River, Cleveland, Ohio, compelled the builders of two types of steel bridges across that stream to resort to cantilever schemes of erection. Both structures are included in the great construction project of the Cleveland Union Terminals Co., which is creating a passenger station with complete steam and electric railway connections in the heart of the city. One bridge is a lift span on the Eagle Avenue Viaduct, designed for vehicle traffic, and the other, on the Cuyahoga Viaduct, is a through truss structure which will carry the four steam and traction tracks forming the western outlet of the terminal. This bridge has three trusses.

The lift span trusses are 216 ft. long, center to center of bearings, and are spaced 44 ft. apart. A downgrade slope from the expansion end to the fixed end of the span causes a difference in elevation at the extremities of slightly more than 2 ft.

Stiff-leg derricks on the ground erected the towers to heights above the concrete piers of approximately 84 ft. The derricks then were placed on the towers at these levels and were lashed down. Two-post bents of 12x12-in. timbers were used as supports beneath the masts and one-post bents beneath the legs. The derrick at the higher elevation had a 127-ft boom and the one at the lower level a 112-ft. boom.

STEEL BENTS ACT AS BRACKETS to support lift span trusses at second panel point, 30 ft. from towers.

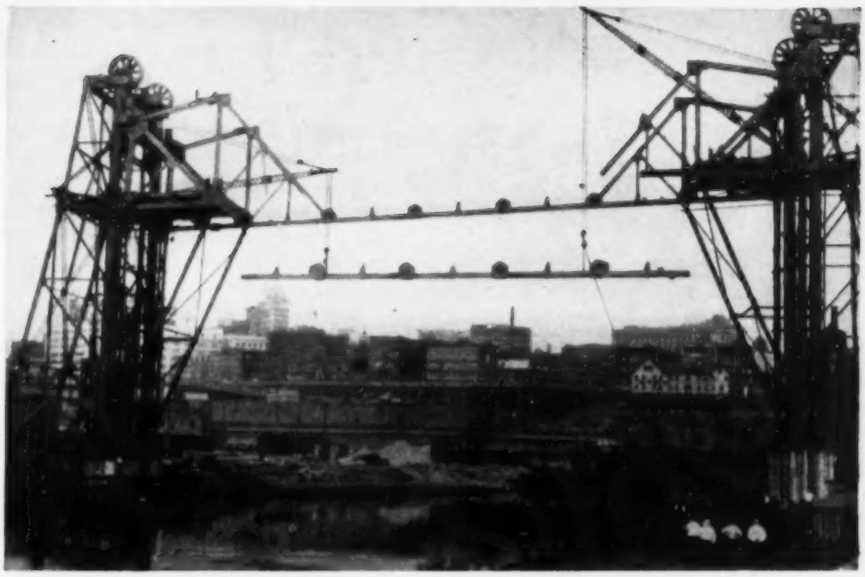


TWO PANELS ARE COMPLETED, including floor system, and are counterweighted before derricks start to erect remainder of span.

Three-post timber bents were placed in front of the tower columns to support the ends of the trusses at their bearing points. The derricks then erected steel bents on the front columns at angles of approximately 23 deg. to support the bottom chords of the trusses at the second panel point, 30 ft. out from the towers. Tie rods connecting the tops of the bents to the tower columns were fitted with turnbuckles for purposes of adjustment.

The steel workers set the 30-ft. sections of the bottom chords and completed erection of the two panels, including the floor system. To cantilever the remainder of the span, F. A. Ulrich, superintendent, concentrated loads of 100 tons of pig iron at the first panel points.

River on FALSEWORK



BOTTOM CHORDS, weighing 19 tons each, are riveted on the ground and raised in one piece from barge in the river.

He then riveted the rest of the lower chords of the two trusses on the ground and raised these sections, weighing 19 tons, into place with the derricks. The remainder of the erection proceeded in the usual way until the last section of the top chord was reached. To make clearance for these sections, comprising two panels, the lower end of the trusses was depressed 2 in. by means of the turnbuckles on the tie rods.

Through Truss Railroad Bridge

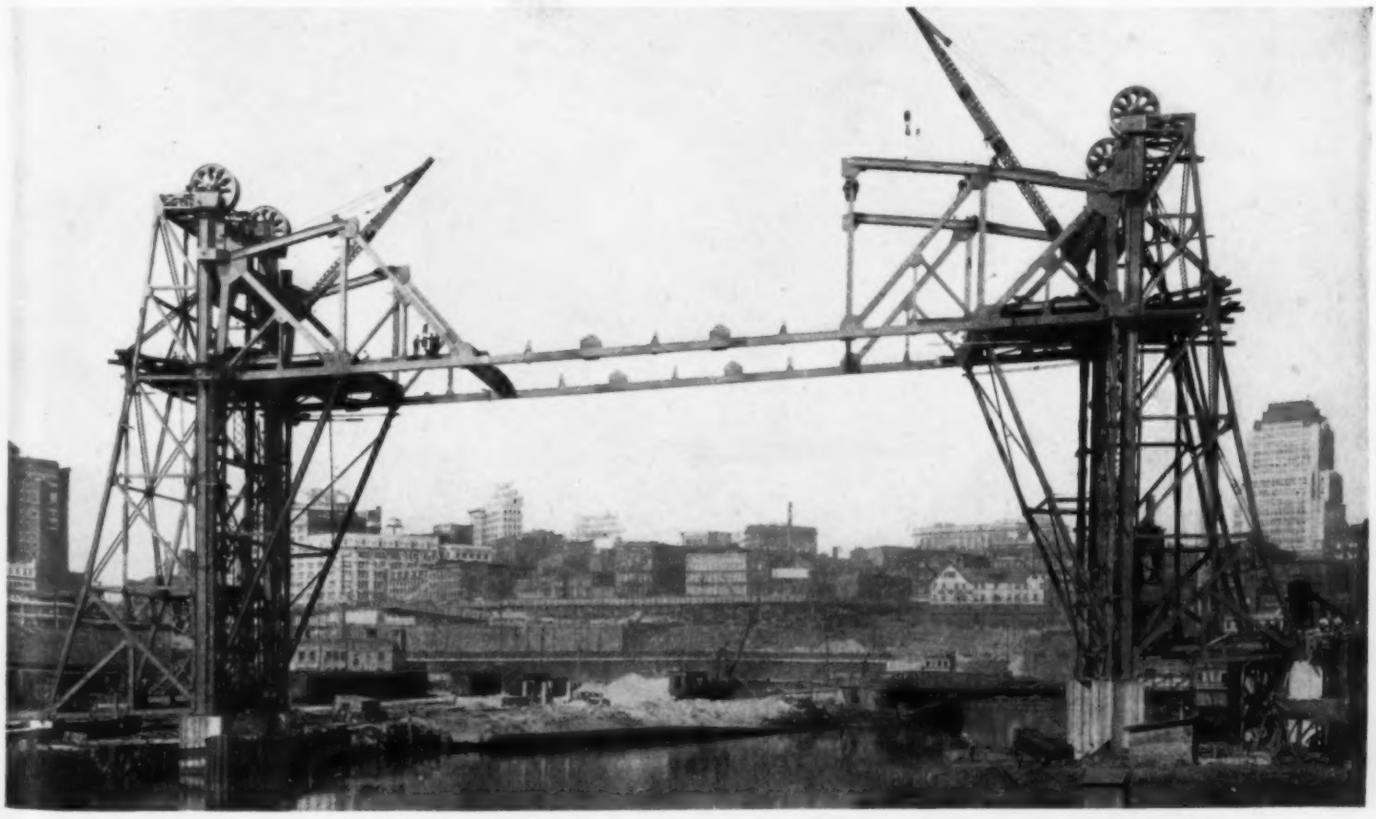
In the natural progress of steel construction on the Cuyahoga Viaduct, erection of the 270-ft. river span started from a high concrete pier close to the south bank of the stream. The approach to the through truss bridge consisted of a deck truss span 140 ft. long and a number of plate girder spans.

To erect the three trusses of the main span, containing 1,818 tons of steel, the American Bridge Company, contractor, anchored the top chords by eyebar chains to the deck truss span and cantilevered 180 ft. to a temporary timber bent on the other side of the river. S. T. France, superintendent, loaded the plate girder span behind the anchorage connections with eight plate girders aggregating 600 tons to counteract the pull in the eyebar chains. At both ends of the eyebar chains connections were made by pins through gusset plate extensions, or "ears," strengthened for the purpose.

When the trusses had landed on the temporary bent across the river, the tension in the chains was released by means of jacks on the bent, and the chains were removed by burning off the "ears."

H. D. Jouett, chief engineer, and N. H. Suloff, engineer of construction, are in charge of all operations for the Cleveland Union Terminals Co.

This company came into being as



ERECTION PROCEEDS BY CANTILEVER METHOD, the derricks remaining in original positions. Adjustment for setting closing section of top chord is obtained by means of turnbuckles on tie rods connecting tops of bents to tower columns.

EYEBAR CHAINS, pin connected to gusset plate extensions, anchor trusses. Load of girders counteracts lift at anchorage connection.

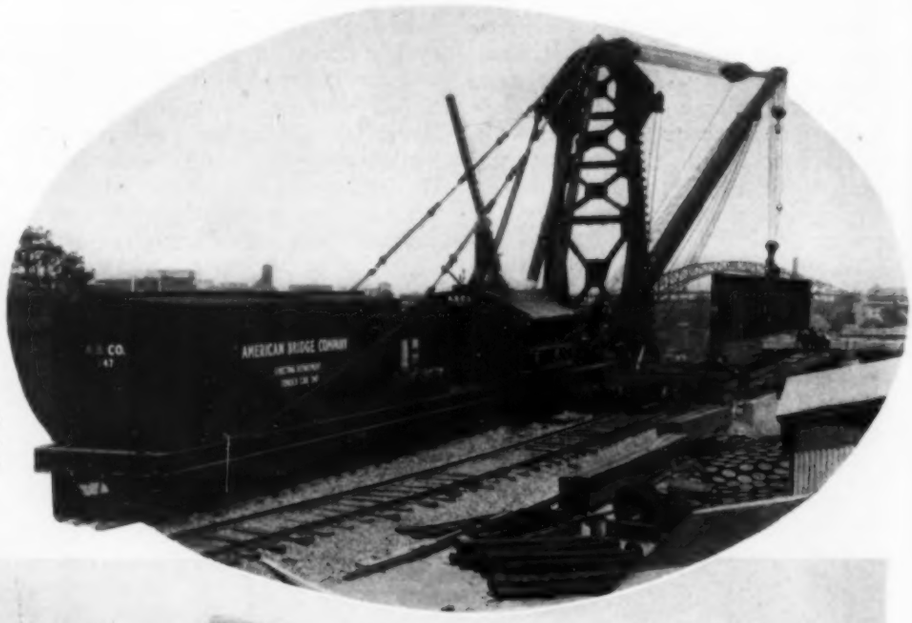
the result of an idea of O. P. and M. J. Van Swearingen to put a terminal on the city's public square instead of on the lake front. It had been the original intention of the Van Swearingen brothers to construct a rapid transit terminal in connection with their Hotel Cleveland as an aid to real estate development on Shaker Heights. In the contest which developed upon their attempting to have the city council pass an ordinance permitting a terminal to be located on the public square, they obtained the backing of three railroad companies by enlarging the plan to provide for a union terminal with steam and traction lines entering it. The Van Swearingens previously had been induced to purchase one of these railroads, the Nickel Plate, while negotiating to purchase a portion of its right-of-way for their rapid transit tracks. The other two companies were the New York Central and the Cleveland, Cincinnati, Chicago & St. Louis.

These three railroad companies formed the Cleveland Union Terminals Co., which they now control through a central railroad committee. All plans and expenditures are passed on by this committee.

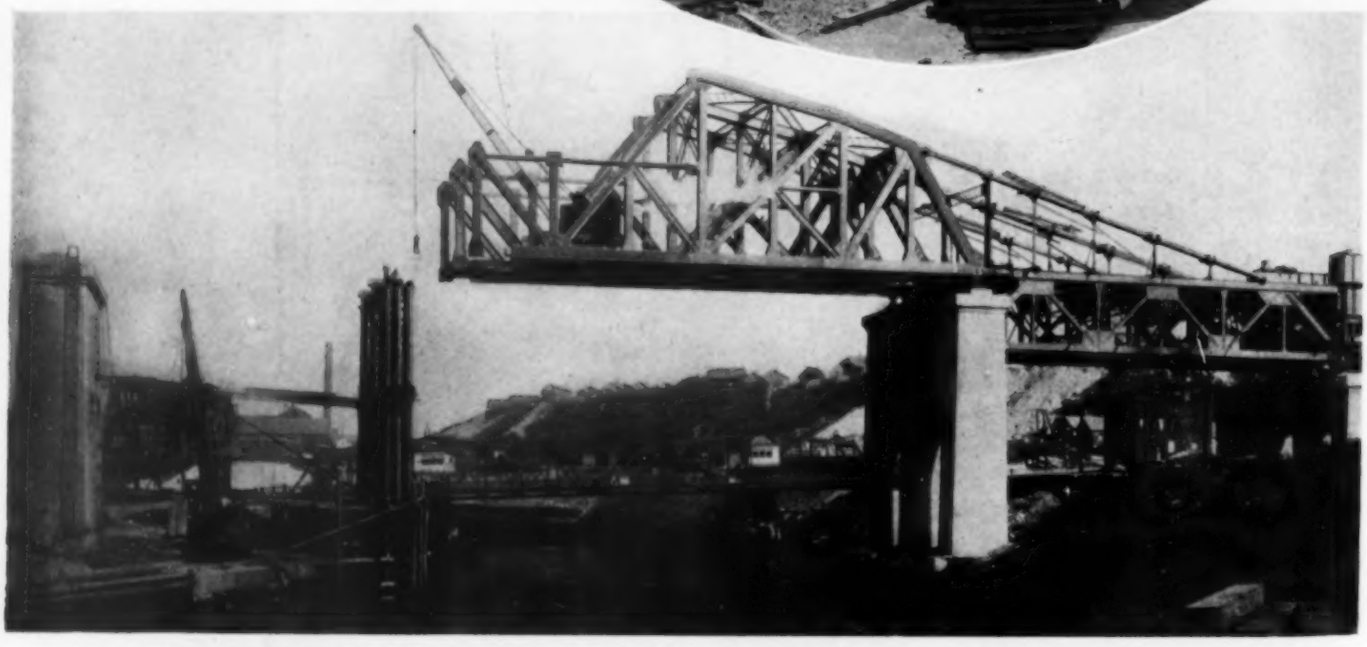
The Cuyahoga Viaduct is the western approach to the union depot. It consists of a steel superstructure carried on concrete piers. In addition to the through truss and deck truss spans described, there are 29 deck plate girder spans, the maximum length of which is 125 ft. The total weight of the steel superstructure approximates 18,500 tons. About 50,000 cu.yd. of concrete was placed in the piers, and the deck required 10,000 cu.yd. Nearly all the piers rest on 50-ft. wood piles.

The main span has a clearance above the river of 95.4 ft. The two piers supporting this span are built on ten caissons about 6 ft. 6 in. in diameter and approximately 100 ft. deep. These caissons rest on bed rock.

A number of street changes were made necessary by the construction of the terminal. One of these changes resulted in the Eagle Avenue Viaduct, a structure having a total length of 3,000 ft. It consists in part of concrete deck carried by structural steel frame. Most of it, however, is reinforced concrete construction throughout, with concrete piers spaced about 30 ft. apart.



DERRICK CAR (*right*) with tank counterweight in rear and holding-down rods at sides of A-frame lifts and swings 110-ton girders.



THREE TRUSSES ARE CANTILEVERED 180 ft. to temporary timber bent by anchoring top chords to deck trusses in rear. Once landed on bent, jacks take strain off eyebar chains, and remaining panels are cantilevered to bearings on concrete pier.

Dust's Death Knell Sounded

Calcium Chloride Effective as Treatment for Traffic-Bound Roads in West Virginia

LAYING the dust on 142 miles of traffic-bound gravel, slag and stone highways in southern West Virginia was effectively accomplished by the State Road Commission last year by the application of three treatments of calcium chloride.

Spreading of the calcium chloride was done from a pneumatic-tired spreader of the "agricultural drill" type attached to a 2-yd. dump truck. The material, in 100-lb. sacks, was unloaded from box cars at the shipping point and hauled by trucks to the spreader truck. Three men on the bed of the spreader truck kept the spreading machine full. It was found more economical to keep the spreader attached to one truck and to use the other trucks for hauling the material.

Types of road treated included traffic-bound slag, limestone, Ohio River gravel and a fairly soft native sandstone gravel from local creeks. The treatments retained their effectiveness longest on the native gravel and shortest on the limestone and slag. Applications were made in May, July and September.

The amount of calcium chloride used on the 142 miles of road was 1,535 tons, which was applied at a cost of $331.30 per mile. The cost of application per ton was $1.92 and of delivery $28.73, making the total cost of treatment $30.65 per ton. The total average amount applied was 2.05 lb. per square yard, the first application being approximately 1 lb. per square yard, and the second and third applications about ½ lb. per square yard each.

The treatments accomplished the desired results. Before the first application early in May, as a result of warm dry weather, great clouds of dust caused by traffic (600 to 1,200 vehicles per day) made living uncomfortable for the residents along the highways and vision difficult for the motorists. After the treatments no further difficulty was experienced.

SPREADER attached to a 2-yd. truck, which carries the calcium chloride, is of the "agricultural drill" type.

Photographs and data from

H. J. SPELMAN,

Division Engineer,

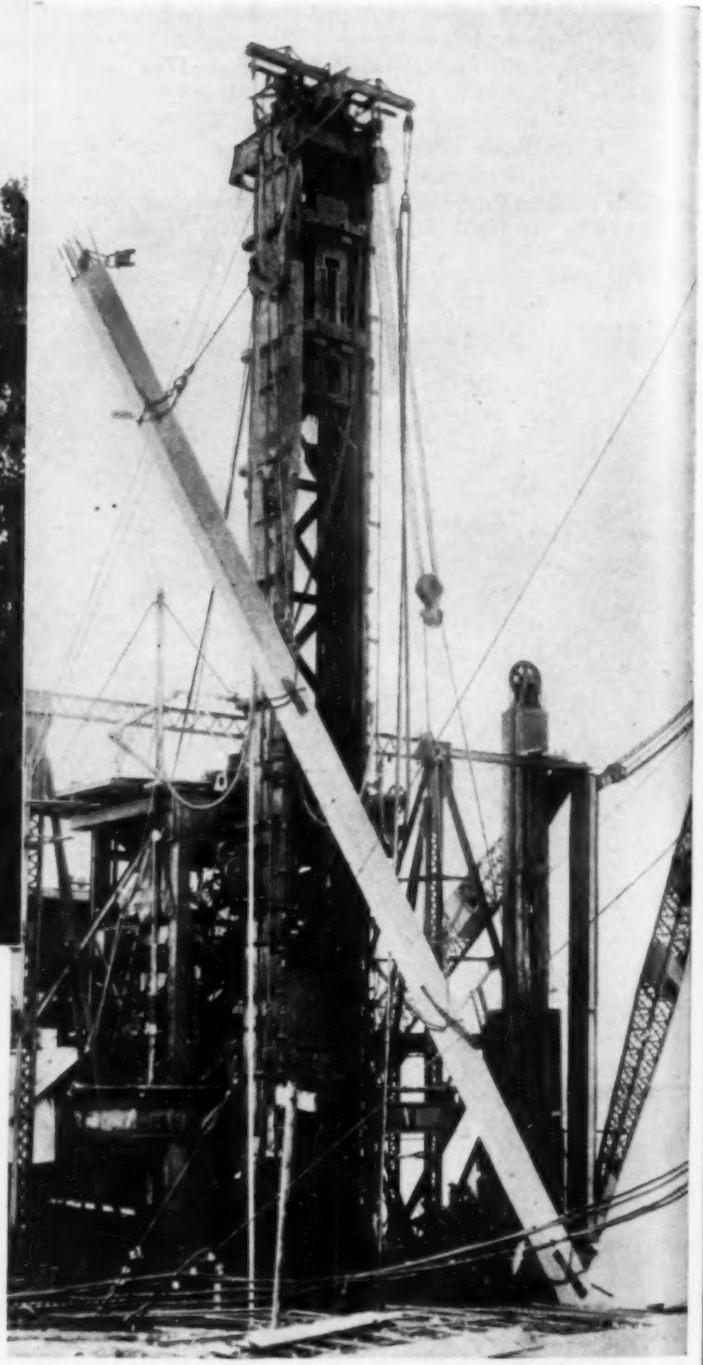
West Virginia State Road Comm.,

Huntington, W. Va.

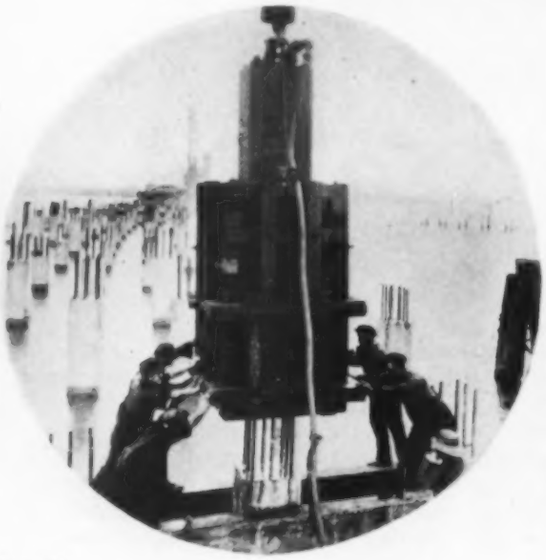
THREE MEN on bed of truck keep spreader supplied with material. Width of application is 18 ft., or two 9-ft. applications.

PILEDRIVING

ADJUSTABLE PIVOTED TELESCOPIC LEADS of the Hardaway Contracting Co., Columbus, Ga., drive plumb and batter piles in a trestle bent from one position of driver. King bolt on which leads are pivoted can be rolled along top beam. When outside batter pile is being driven, roller rests in seat in beam, and leads are held at bottom by pin dropped through yoke behind leads into built-up moon beam.



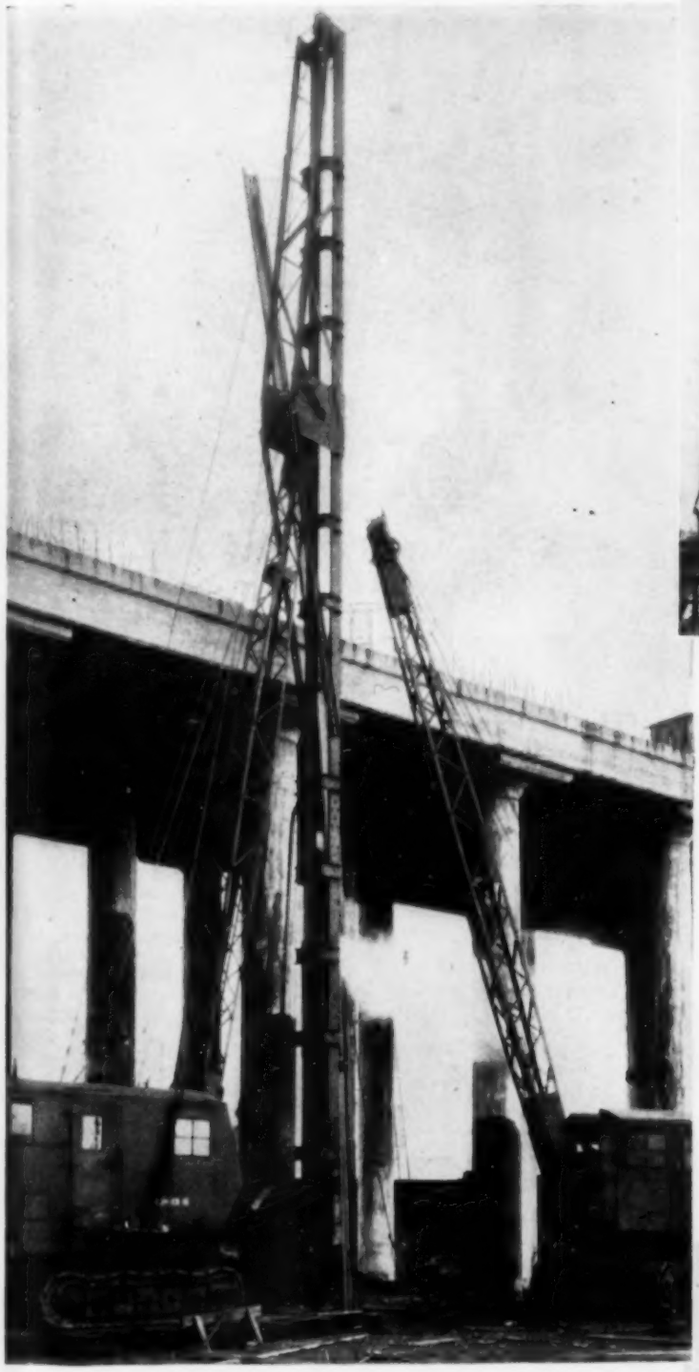
TALL STEEL MOVABLE LEADS on floating piledriver put down precast concrete piles, 110 ft. long by 24 in. square, weighing 32 tons, in plumb and batter positions. The leader carriage carries machinery to move it fore and aft on rollers and to swivel the leads transversely for driving batter piles. The leads, 93½ ft. long from top of pile sheave to water line, rest on a pintle bearing on the upper transverse girder. Leads may be moved 9 ft. transversely. Z-bar track guides special 15-ton Union steam hammer.



MATCHED HOLES OF SPECIAL DRIVING BLOCK (*left*) used by Patrick McGovern, Inc., fit over projecting bars. Rig transmits blow from McKiernan-Terry steam hammer directly to butt of pile.

DETAILS

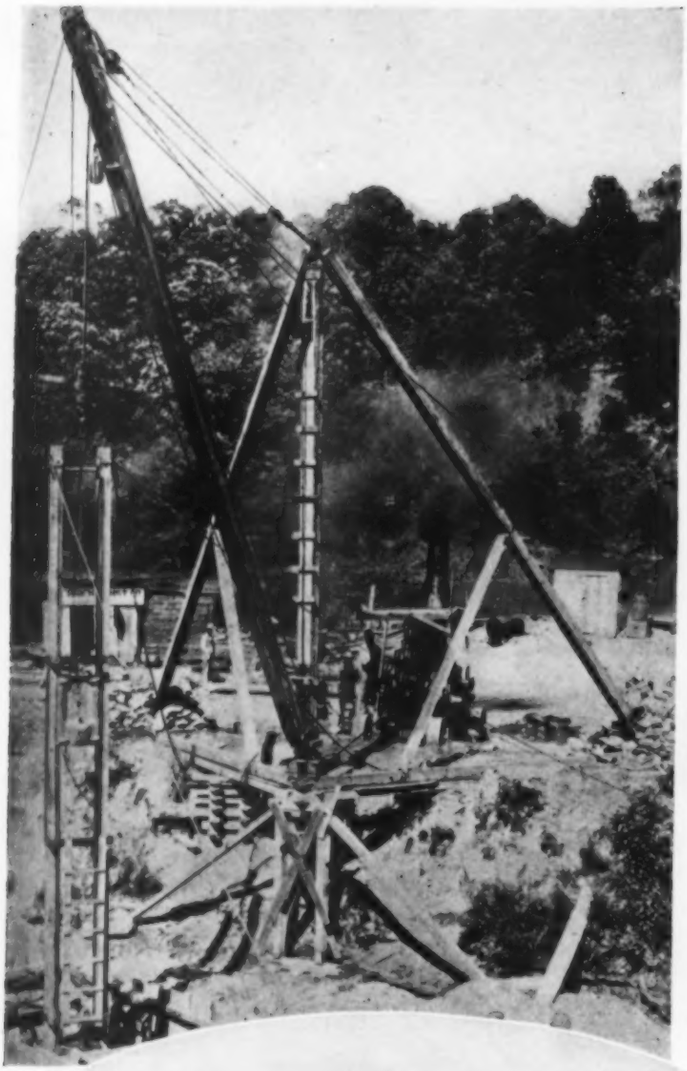
PORTABLE BATTER PILEDRIVER, 40 ft. high, was designed by Doullut & Ewin, Inc., of New Orleans to drive concrete piles 45 ft. long. The steel frame rests on the railroad tracks, and the machine is skidded forward as the work progresses. An American locomotive crane moves the driver and places piles in the leads.



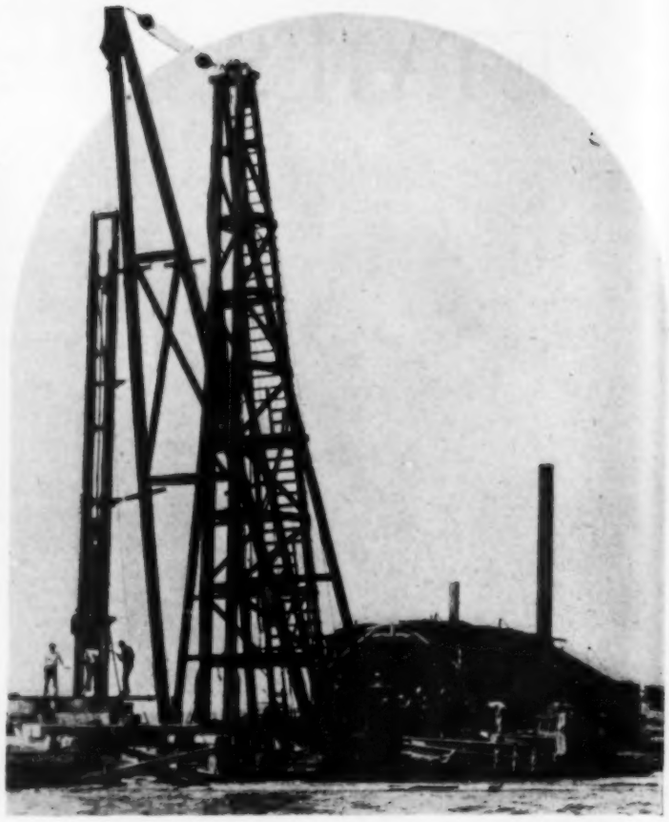
EXTENDED LEADS supported on boom of Industrial crane handle long steel sheet piles for the Horton Construction Co. of Buffalo. A McKiernan-Terry hammer drives the piles to rock. The second crane picks up the piles and helps to place them in the leads.

MORE PILEDRIVING DETAILS
on next two pages

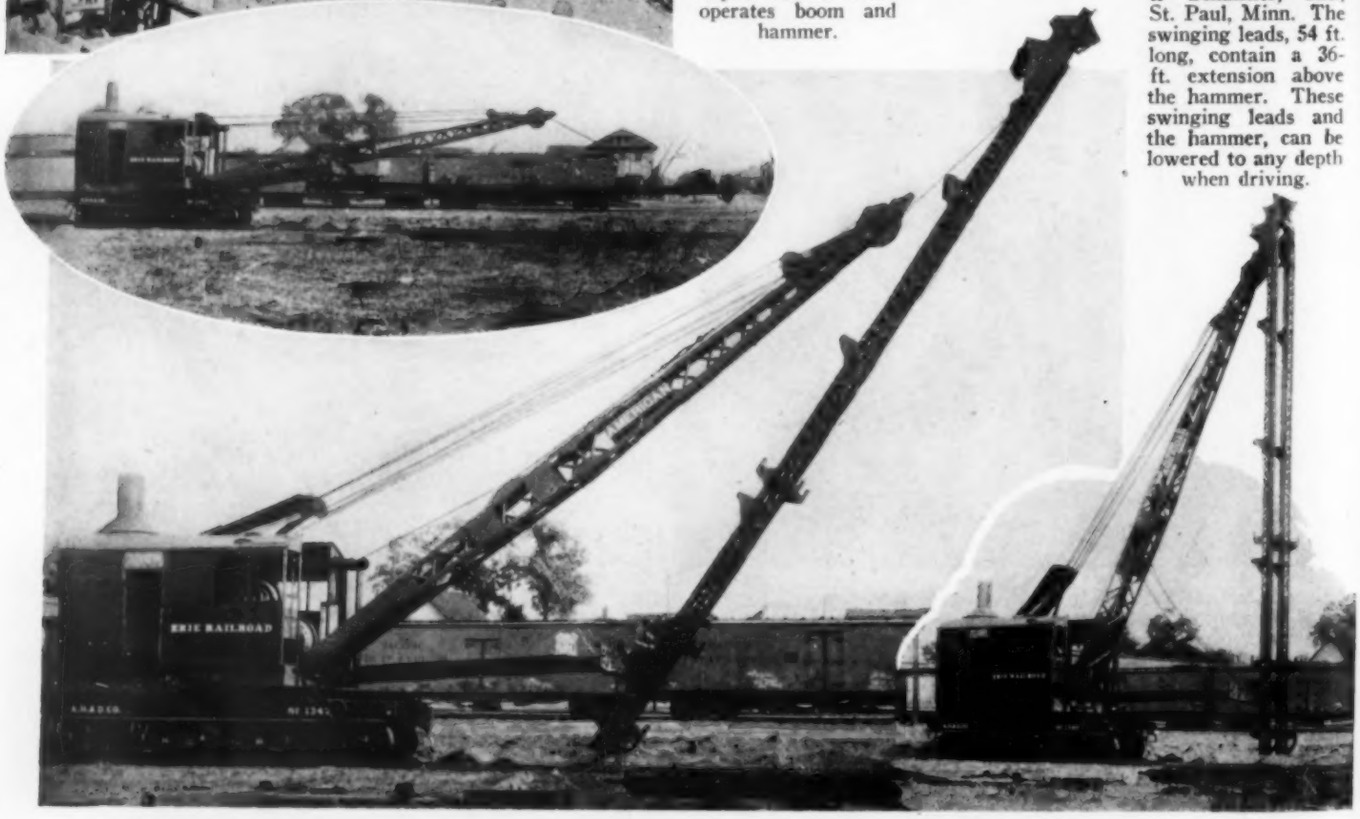
BATTER PILEDRIVER of the Foundation Co. is mounted on a carriage equipped with flanged wheels. Steam boiler operates hoist and hammer.



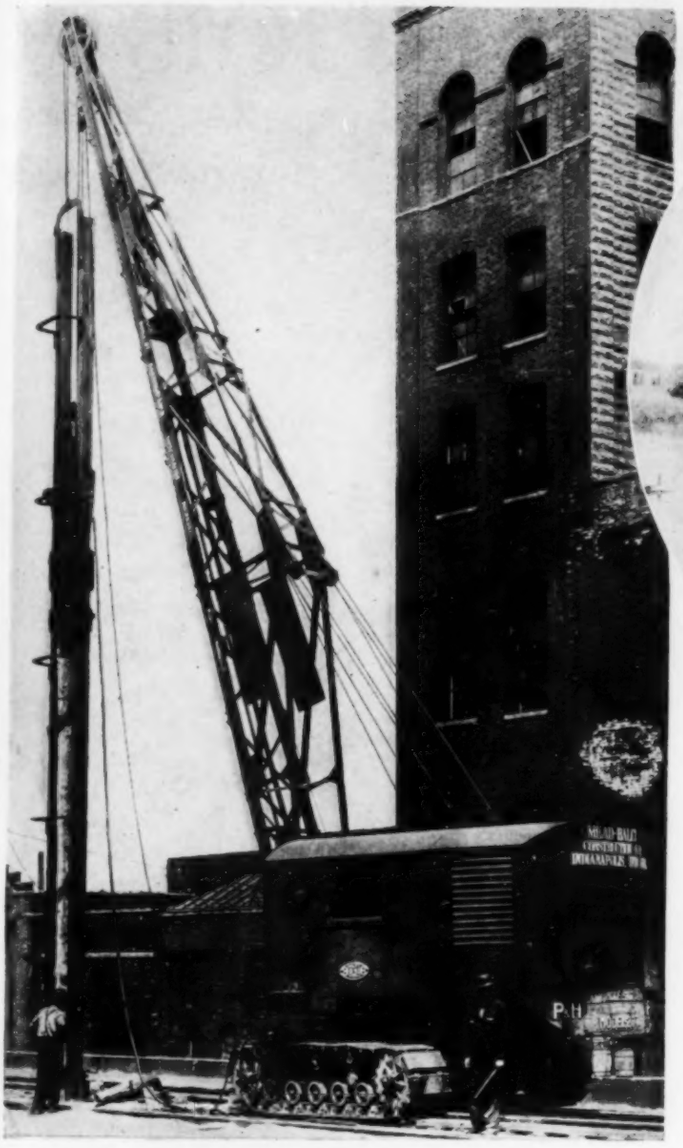
SWINGING LEADS (*left*) hung from boom of stiff-leg derrick are used by the Herrick Construction Co. in driving wood piles with drop hammer. A Clyde steam hoist operates boom and hammer.



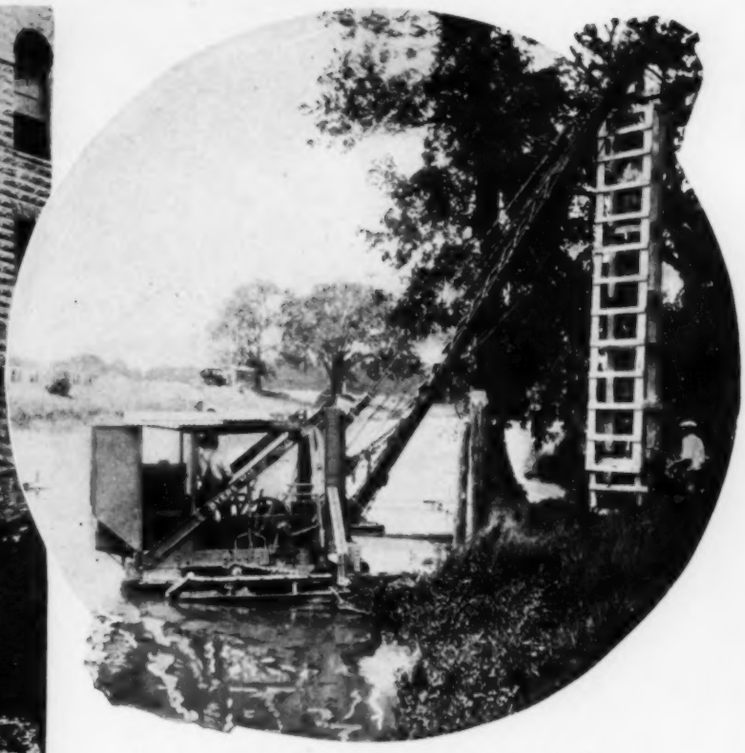
TELESCOPIC SWINGING LEADS (*above*) suspended from shear leg erected on front of floating piledriver put down 80-ft. timber piles under 40 ft. of water with McKiernan-Terry steam hammer for the Northwest Florida Corporation, organized by Johnson, Drake, & Piper, Inc., Minneapolis, Minn., and Siems, Helmers & Schaffner, Inc., St. Paul, Minn. The swinging leads, 54 ft. long, contain a 36-ft. extension above the hammer. These swinging leads and the hammer, can be lowered to any depth when driving.



COLLAPSIBLE LEADS of the Erie Railroad Co.'s American locomotive crane fold up before traveling. The operations of raising and lowering the leads are almost automatic. For driving batter piles, the leads are pinned to a semicircular guide, making a simple arrangement.



SWINGING LEADS of common type are suspended from boom of P&H crawler crane by the Mead-Balch Construction Co., Indianapolis, Ind., to drive round piles with steam hammer.



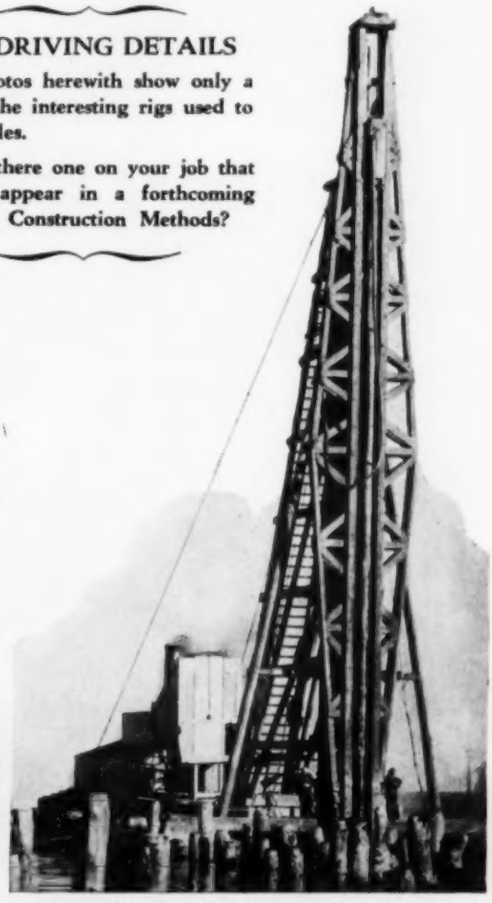
WOOD LEADS, tied to boom of Byers half-circle ½-yd. crane, leave drums free to handle piles and operate the 3,000-lb. drop hammer. This outfit eliminates cost of large equipment on smaller jobs.

PILEDRIVING DETAILS

The photos herewith show only a few of the interesting rigs used to drive piles.

Isn't there one on your job that should appear in a forthcoming issue of Construction Methods?

MOVABLE LEADS, mounted on skids, enable a Universal truck crane of the Crane Service Co., New Orleans, La., to drive 50-ft. piles at greater than 100-ft. radius from one central set-up. Crane winches move the leads.



PENDULUM LEADS 100-ft. high, pin-mounted on main leads 80 ft. high, handle plumb and batter piles 82 to 120 ft. long for Foley Bros.

BAR JOISTS

Reduce Lost Time on Building to Work Together

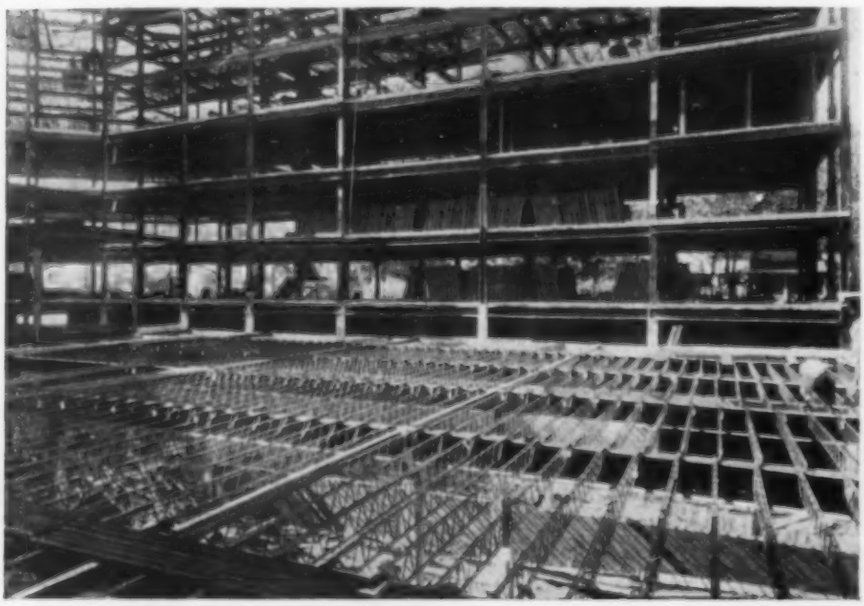
LAKE SHORE HOTEL, Cleveland, is a U-shaped, ten-story structure having 20,400 sq.ft. of area on each floor. The structural steel frame carries floors of bar joist construction and tile walls, the walls being covered by brick facing.

FACTORS of contractor's organization and equipment being equal, the materials entering into a building offer two possible ways of accelerating construction. The designer can choose materials which themselves can be assembled and molded quickly into the completed structure, or he can use materials which permit all construction operations to proceed simultaneously without interference or interruption. John Gill and Sons, Cleveland, builders of the Lake Shore Hotel in that city, apparently scored in both respects, but particularly in the second, as the result of the architect's selecting welded bar joists to carry the concrete slab floors of the hotel. The Frank W. Bail Co., Cleveland, designed the building.

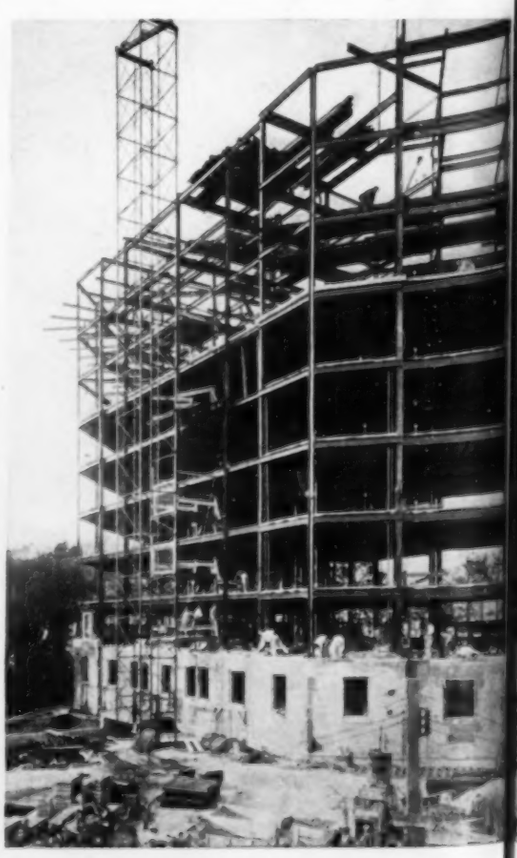
Use of bar joists permitted the contractor to co-ordinate the overlapping operations of his own men and of the subcontractors' mechanics in such a way as to make uninterrupted progress possible for all. Workmen carried on the individual operations in the following sequence without being delayed themselves, and without causing interference to their fellows:

1. Erecting structural steel.
2. Placing floor joists as the steel went up.
3. Installing floor lath and temperature reinforcing for the concrete slab as rapidly as joists were placed.
4. Placing electrical conduit immediately after the installation of floor lath.
5. Pouring floor slabs.
6. Installing plumbing, heating, and ventilating equipment as soon as concrete had set.
7. Laying brick and tile in walls following floor construction.
8. Placing sash and glazing as walls went up.
9. Setting interior door bucks and laying out partitions with one or two courses of tile as soon as the floors were inclosed.
10. Installing elevators.
11. Completing partitions on lower floors.
12. Applying ceiling lath.

The Lake Shore Hotel is a ten-story U-shaped building having an area of 20,400 sq.ft. on each floor. A basement and smaller sub-basement for



COURT of the hotel is carried over the basement extension by steel frame and bar joist construction. Substitution of this system for the concrete column and flat slab construction originally intended is reported to have saved $10,000.



CONSTRUCTION OPERATIONS follow each other in a natural sequence which eliminates interferences and expedites the work. Structural steel, bar joists, floor lath,

FOR FLOORS

Job by Allowing Several Trades Without Interference

garage and service facilities have a total floor area of 37,000 sq.ft. The basement extends 80 ft. out from the front of the building under the court between the wings of the U.

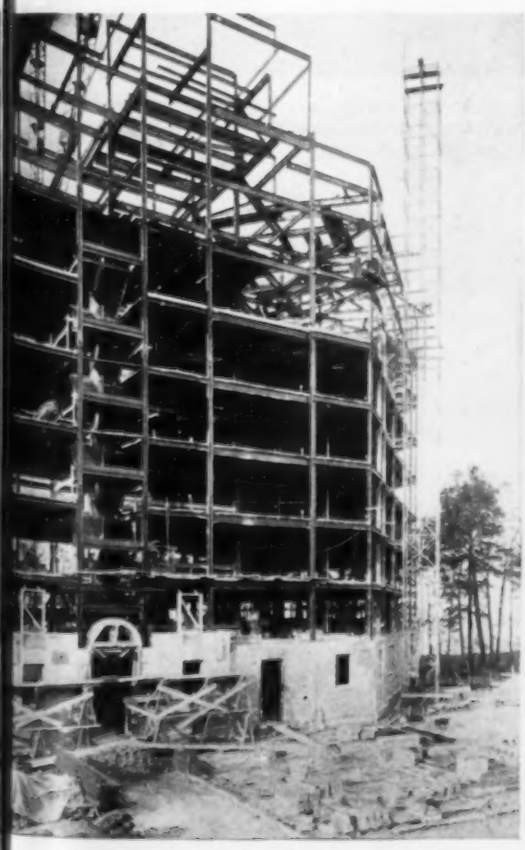
Floor design called for bar joists carried on the beams of the structural steel frame. A 3-in. monolithic concrete slab was placed on $\frac{3}{8}$-in. rib floor lath and was reinforced against temperature variation with $\frac{5}{16}$-in. round bars placed diagonally to the joists on 18-in. centers.

The Forest City Structural Steel Co. supplied and erected the 1,500 tons of structural steel and the 380 tons of Massillon bar joists, as well as the floor lath. This contractor used three guy derricks to hoist and place the steel and joists. The first steel delivery to the job was made on Aug. 10, and erection was completed by Oct. 20. As a result of this progress, the builders were able to finish the structure 2 months ahead of schedule.

C. B. Crebbins and R. E. Bail, superintendents for the contractor and for the architect, respectively, made full use of the possibilities offered by bar joist construction for co-ordinating the operations of the trades. Absence of formwork and of delays caused by waiting for concrete to set helped to expedite construction. The concrete crew poured the monolithic slab in large squares and floated the surface to a cement finish. A heavy bed of sawdust protected the concrete from operations above and retained the water necessary for curing.

Two elevators operating in tubular steel towers hoisted the materials. The brick masons started after six floors of steel had been placed and averaged three floors a week in erecting the walls of face brick backed up with tile. Materials were stored on appropriate floors as fast as the concrete set. The only overtime work on the building was for two weeks during which materials were moved in and stored.

BAR JOISTS are installed as soon as the structural steel is erected. The next crew places the floor lath and the temperature reinforcing for the 3-in. concrete slab. Electrical workers follow closely upon floor lathers.

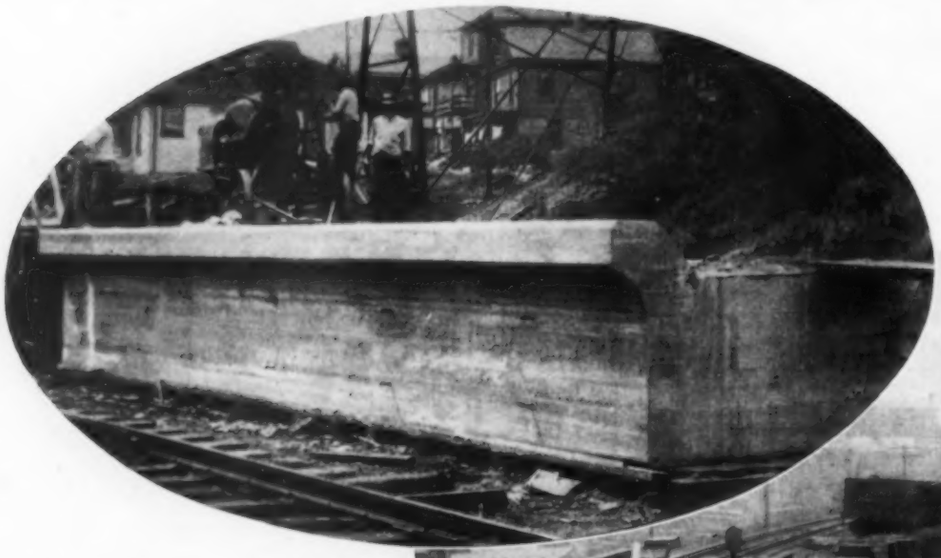


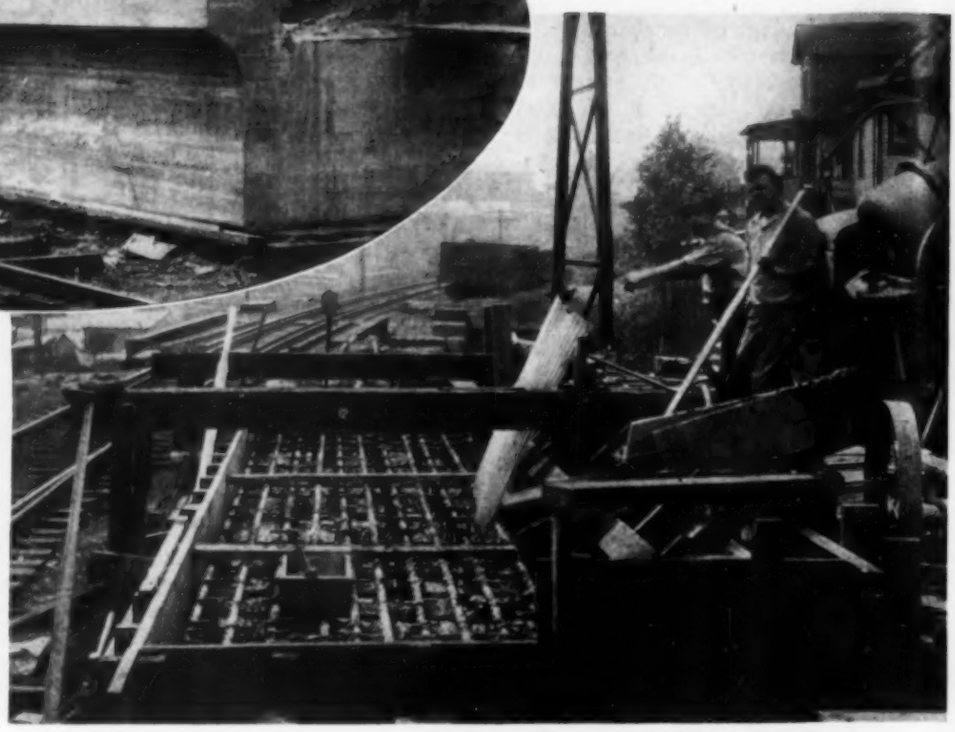
electrical conduit, floor slab, and plumbing pipes are placed in order. Brick masons and sash and glazing men follow several floors below these operations

SAWDUST COVERING is spread over the concrete slab to protect it and to hold the water for curing. Electrical conduit is placed prior to pouring of concrete. As soon as the concrete sets, workmen start bringing in materials and storing them on the slab.

PRECAST RAILROAD BRIDGE

Placed in 3 Hours

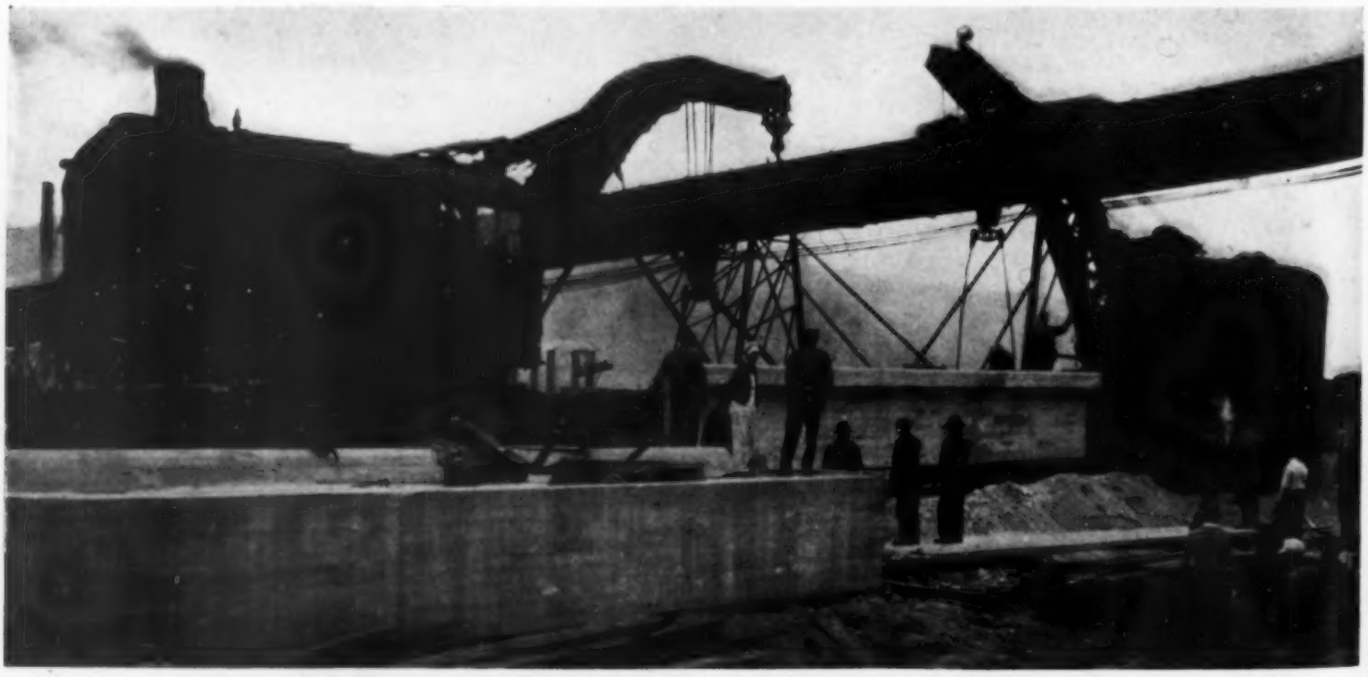




IN REPLACING an old Pennsylvania Railroad bridge at Martin's Ferry, W. Va., the use of precast concrete slabs of high-early-strength concrete interrupted traffic for only three hours during construction and was so effective that S. E. Holland, division engineer in charge, is planning several similar projects.

The two slabs were 35 ft. long, 7 ft. 10 in. wide and 4 ft. thick and each weighed about 70 tons. In the 1:1.5:3.5 mix the water content was 6½ gal. per sack of standard Universal portland cement, giving a slump of 2½ in. Completed slabs were ready for service 4 days after casting.

SLAB REINFORCING consists of 1¼-in. twisted bars 8 in. on centers both vertically and horizontally and ⅝-in. deformed vertical bars. *(In oval)* COMPLETED SLAB, with forms removed, ready for placing.



CRANES RAISE SLABS for bridge by means of 8-in. rings anchored in the concrete.

POWER SCRAPER EXCAVATES 45,000 yd. of boulders and broken stone from rough bed rock of river bottom in 2½ months. Two men operate plant. An A-frame is used to pile the material.

POWER SCRAPER Digs Tailrace Saving COFFERDAM COST

WHEN the engineers of the Byllesby Engineering and Management Corporation faced the necessity of excavating the boulders and broken rock below the new hydro-electric plant of the Northern States Power Co. near Chippewa Falls, Wis., to make a tailrace, they settled upon a power scraper as the most economical tool. The Garst Manufacturing Co., Chicago, installed a 2½-yd. scraper operated on 1¼-in. cable by a 100-hp. steam hoist. This outfit deepened the channel 10 ft. to a width of 125 to 150 ft., removing 45,000 cu.yd. of material at a cost approximating $0.50 a yd., in 2½ months.

As a matter of fact, the power scraper method was the only practical one for the situation. To use a cofferdam and power excavators would have required shutting down the power plant and would have entailed an estimated cost of $5 a yard. As the river was not navigable, the expense of bringing in dredges would have been excessive; the character of the material prohibited the use of pumps.

Local conditions afforded but one position for the A-frame and hoist. Material had to be piled on a bank 15 ft. above water level at this location. The power house walls occupied most of the opposite side of the tailrace and prevented the hoist's being placed there. A heavy tail bridle rope, stretched from two dead men on the opposite shore, held the tail block and allowed it to be moved easily.

W. T. Walker, general superintendent of construction, and W. H. MacArthur, resident superintendent of construction, were in charge for the Byllesby Engineering & Management Corp.

A 2¼-YD. BUCKET operates on a 1¼-in. cable which has to be renewed every month. Some stones are too large for this bucket to handle.

Mountain Slopes Gouged for Brazil Highway

By TIMOTHEO PENTEADO,
Chief Engineer
Brazilian Federal Highway Comm.,
Rio de Janeiro, Brazil

MARSHY lowlands and precipitous, rocky mountains presented serious difficulties to the builders of Brazil's 38½-mile federal highway from Rio de Janeiro to Petripolis, in the interior. Although the mangrove swamps of the coastal region caused much worry to the engineers, because of the lack of suitable material for fill on 25 miles of the road, the greatest difficulties were encountered on the 12½-mile section through the Serra do Mar, where the highway climbs in a short distance to an elevation of 2,800 ft.

The rocky slopes of the mountains were so precipitous that drilling operations had to be undertaken from suspended platforms. Work was started simultaneously on all parts of the mountain section, and the builders faced a serious problem in transporting workmen, air compressors, tools, pipe, and materials to the various points of activity. Ingersoll-Rand compressors supplied the air for the drills.

At one place, where a towering bluff blocked the right-of-way, the crews blasted a gallery in the face of the rock, so that the cliff now overhangs the highway. Numerous bridges and viaducts of reinforced concrete carry the road over narrow gorges and along the steep rock slopes. Much of the rock excavation, amounting to about 1,390,000 cu.yd. total, was used for building protective walls along the rocky bluffs.

To keep within the conditions established for the road, such as a maximum grade of 6 per cent and a minimum radius on curves of 164 ft., it was necessary to relocate a large portion of the old highway through the

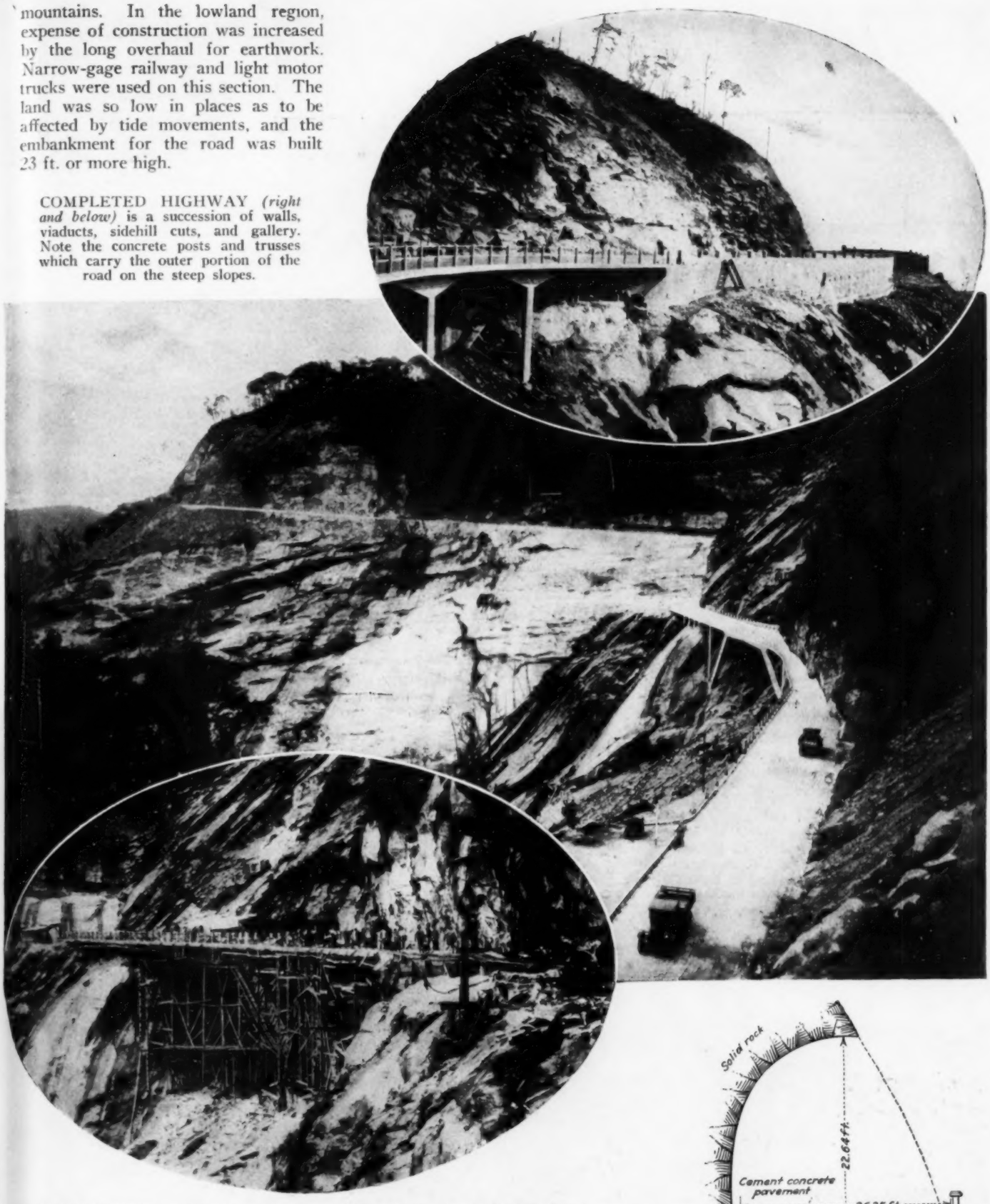
VIADUCT of reinforced concrete under construction along the steep slope of a mountain side.

SUSPENDED PLATFORMS *(top center)* enable the workmen to attack the sheer face of the rock wall with their drills.

GALLERY through an obstructing cliff is constructed with difficulty.

mountains. In the lowland region, expense of construction was increased by the long overhaul for earthwork. Narrow-gage railway and light motor trucks were used on this section. The land was so low in places as to be affected by tide movements, and the embankment for the road was built 23 ft. or more high.

COMPLETED HIGHWAY *(right and below)* is a succession of walls, viaducts, sidehill cuts, and gallery. Note the concrete posts and trusses which carry the outer portion of the road on the steep slopes.



FALSEWORK supports forms for one of the viaducts. Gallery in solid rock is under construction at right.

ROCK GALLERY driven along the face of the precipitous mountain side where conditions prohibited use of sidehill cut.

Waterbound macadam, bituminous macadam, or gravel now form the surface of the highway for all but 2 miles which are paved with concrete. Reinforced concrete slab is to be placed on the rest of the road this year.

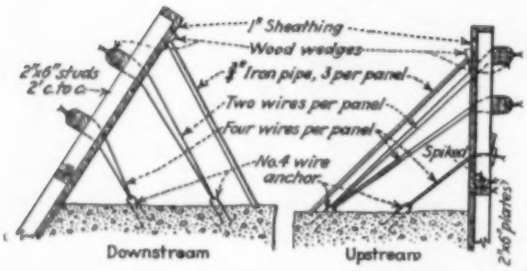
The highway was designed and constructed under the supervision of the Brazilian Federal Highway Commission.

Getting Down to DETAILS

[Close-up Shots of Job Methods and Equipment]

ON STEEP GRADES *(left)* a paving mixer can't operate to best advantage. A Pacific Coast contractor solves the difficulty on one of his recent jobs by leveling up the paver with triangular-shaped blocks inserted under the front ends of the crawlers.

HORIZONTAL TEETH *(above)* on moldboard of road grader prove effective in cutting away projecting banks at turns during road widening operations in Tennessee.

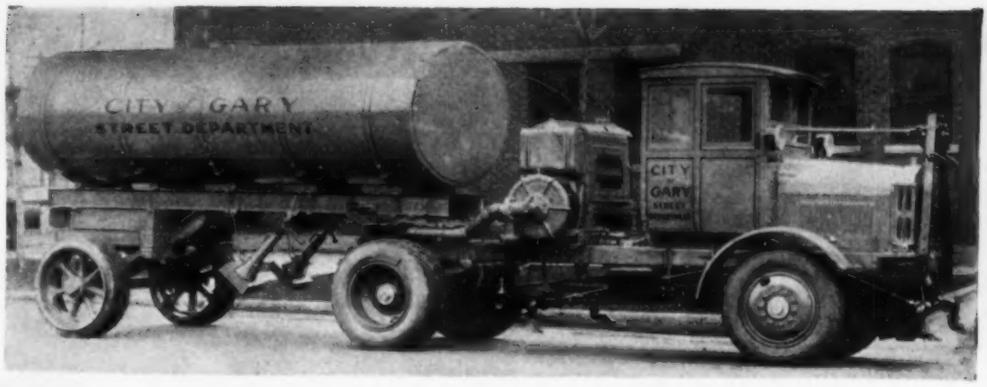


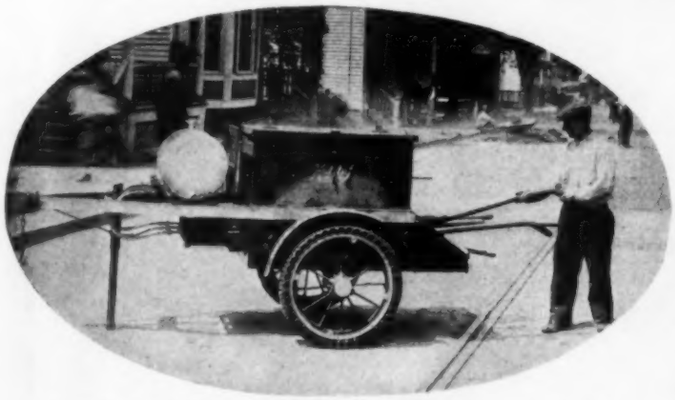
PIPE BRACES, devised by E. R. Stokes, of the Utah Construction Co., supported form panels during concreting of Exchequer and Hetch Hetchy dams. Tie wires, tightened by wedges, held panels against braces.

SKULL CRACKER, suspended from boom of a Thew locomotive crane, makes quick work of demolishing a boardwalk pavilion of reinforced concrete at Atlantic City, N. J. The demolition work, handled by the Atlantic Construction Co., was necessary to clear the site in front of the huge new Convention Hall, a corner of which appears in the background of the picture. An article describing the construction of the Convention Hall will be found on pp. 34-37 of this issue.

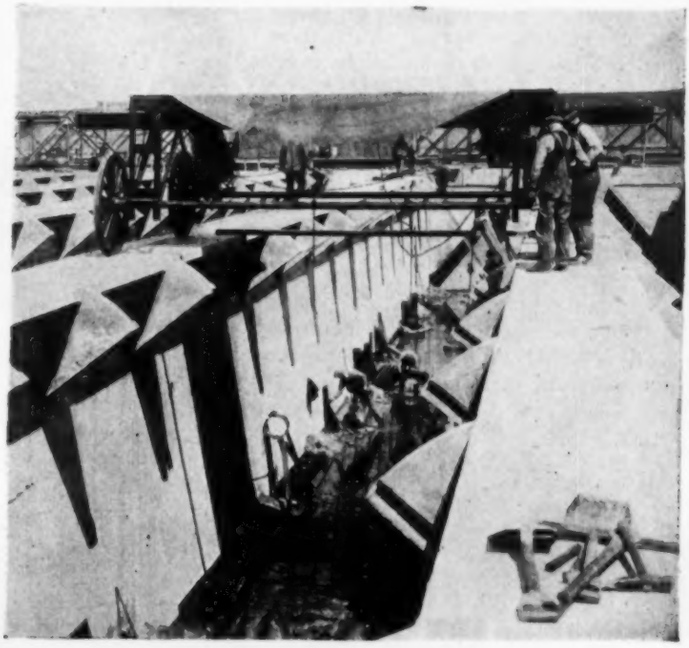
CITY'S "HANDY MAN" (*right*). This Four Wheel Drive unit at Gary, Ind., performs a variety of jobs for the Department of Streets: Flushes streets, oils earth roads, plows snow, sprays trees, cleans sewer manholes, unwaters flooded basements, hauls garbage, maintains roads, and does miscellaneous heavy-duty hauling.

Haven't YOU a picture of some interesting job detail on your work? Send it along to the Editor.

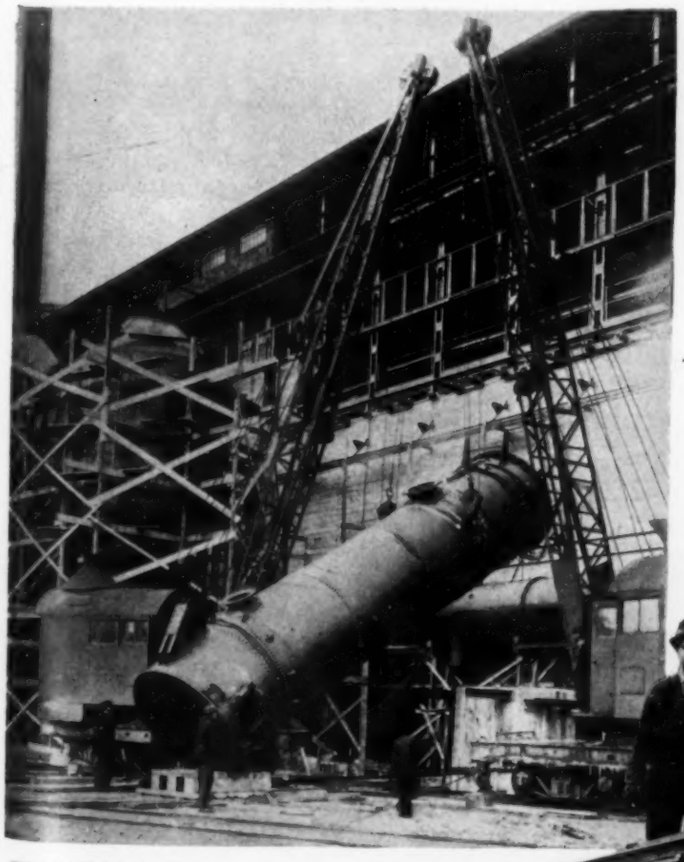




A TWO-PURPOSE OUTFIT. While heating asphalt for paving repairs by the McDonald Construction Co., of Flushing, N. Y., this Mohawk wheel-mounted rig also warms the spreading and finishing tools used on the work. Heating is done by oil burner.



TRAVELING HOIST, equipped with motor, raises and sets precast concrete baffle slabs on inclined brackets of aeration tanks at North Side Sewage Works, Chicago. Baffles, 3 ft. 10 in.x9 ft. 9½ in.x4½ in., are cast end to end, on tar paper, in tank bottoms immediately below their final position.



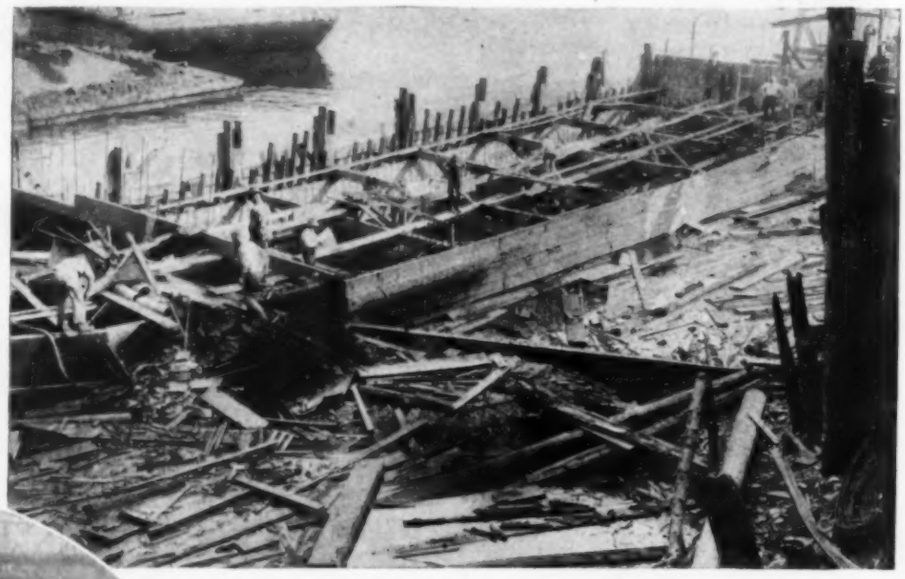
TEAMWORK by operators of two Browning cranes solves problem of erecting 30-ton waste heat boiler for U.G.I. Contracting Co. Note base block supported on rollers.

SPECIAL TRAILERS, (*below*) used by Edison Electric Illuminating Co., of Boston, do away with necessity of jacking up cable reels prior to feeding cable into ducts.

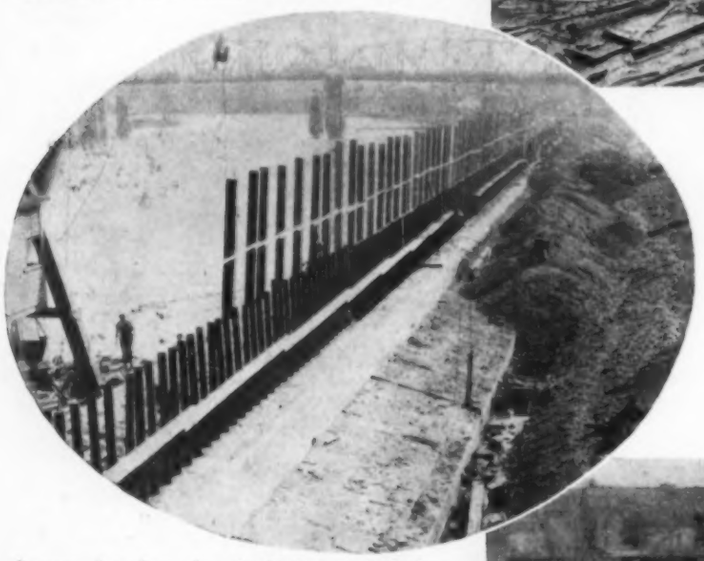
FLOATING PLANT
Concretes Bulkhead Wall for PORTLAND SEWER

IN CONSTRUCTING the concrete wall which forms the upper portion of a combination timber and concrete bulkhead along the west bank of the Willamette River, Portland, Ore., the contractor employed a plant and methods differing somewhat from usual practice. The design of the bulkhead and the construction of the subaqueous timber crib foundation were described in *Construction Methods*, October, 1928. The concrete wall which rests on this timber crib is 5,000 ft. long, 26 ft. high, 24 ft. wide at the base, and 5 ft. wide at the top. It and the intercepting sewer which it protects contain a total of 57,000 cu.yd. of concrete.

A floating plant mixed and placed the concrete in the wall. Concreting usually started at five o'clock in the afternoon and continued for 8 or 10 hours, leaving the daylight period for replenishing material supplies. The method of handling the cement was the most unusual feature of the job. This material was received in bulk at a dock along the river where it was unloaded by power scraper and transferred through worm conveyors and storage bins to a long V-shaped hopper on the cement barge. The hopper had a narrow flat bottom, 4 ft. wide, and sides sloping at 45 deg. with the deck. In unloading the barge, another power scraper pulled the cement from one end of the hopper into the boot of an elevator on the floating concrete plant. The elevator placed the cement in storage bins over the two mixers, from which it was drawn off to the weighing hopper through a 12-in. pipe.

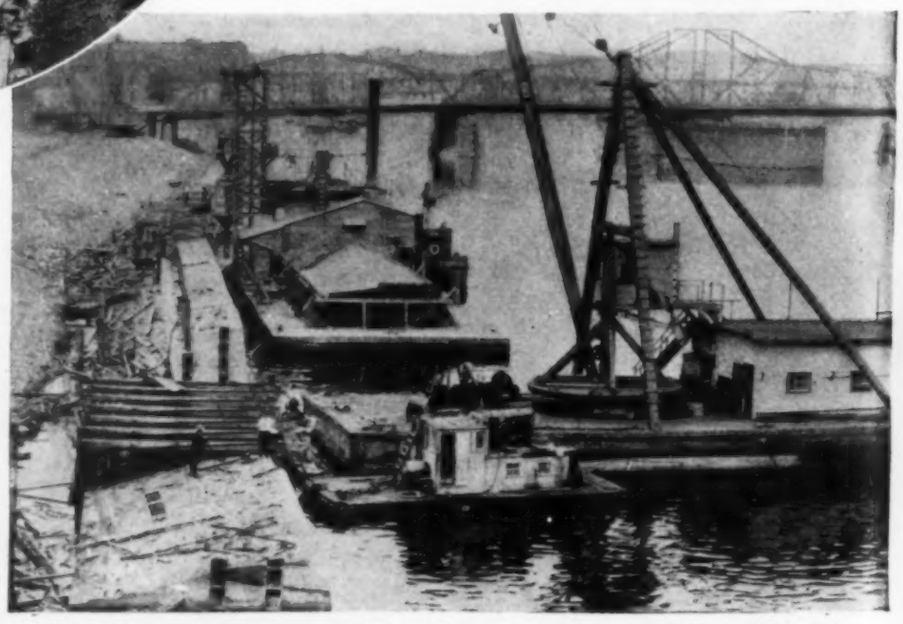


PUMPING PLANT under construction at river end of intercepting sewer will dispose of all municipal sewage during periods of high water.

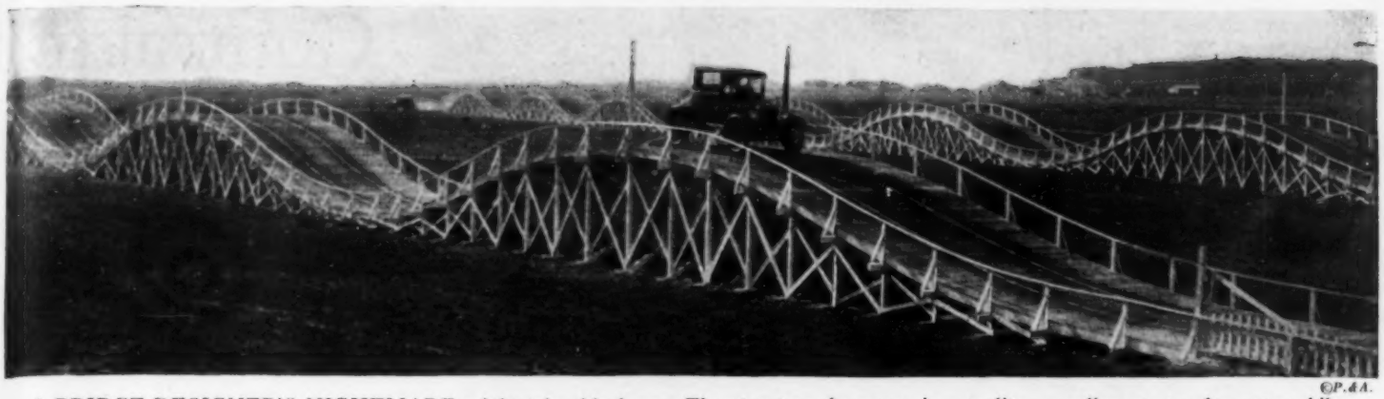


FILL behind bulkhead wall is placed soon after concreting to allow settlement.

A steam boiler supplied power to the various engines on the concrete barge and to the generating plant which produced electricity for night operation. The J. F. Shea Co., Portland, was the general contractor, and all operations were under the supervision of O. Laurgaard, city engineer.



FLOATING PLANT mixes and places all concrete for 5,000-ft. bulkhead wall. Barges deliver materials to the plant.

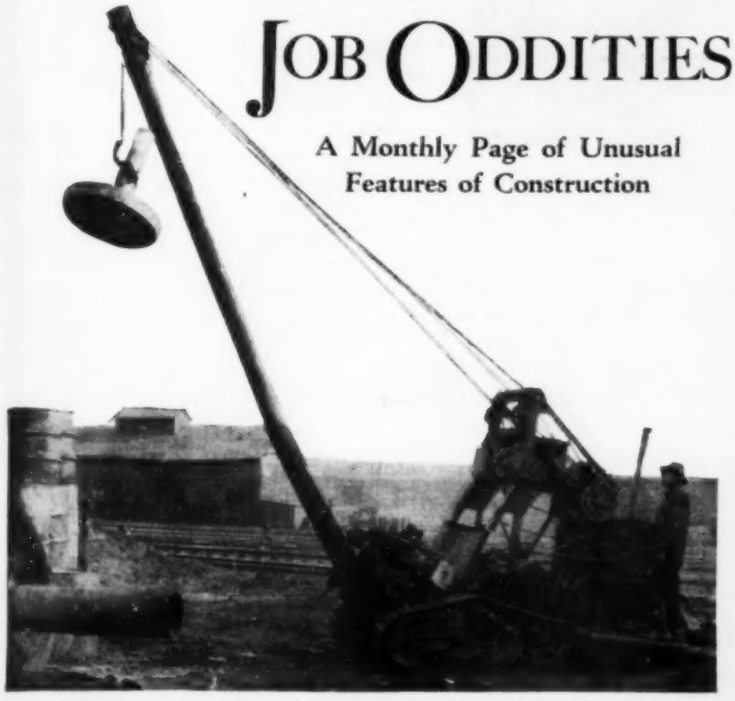


©P.&A.

A BRIDGE DESIGNER'S NIGHTMARE might take this form. The structure, however, is a reality—a roller coaster for automobiles in Los Angeles, with dips and rises of from 5 to 10 ft.

JOB ODDITIES

A Monthly Page of Unusual Features of Construction



DOWN, BUT NOT OUT! After this Barber-Greene ditcher had excavated 30 miles of trench an Alabama junk dealer gave it a new lease on life by equipping it with a boom. Thus converted into a crane the "ditcher" loads and unloads cars.

©P.&A.

STRUCTURAL ATMOSPHERE (*above*) characterizes the design of this road-side "freezer" from which ice-cream cones are dispensed in Hollywood, Calif. From our point of view the chilly setting is effectively tempered by the presence of Esther Ralston, screen star. Nothing cold about that smile of hers!

If there's anything odd on *your* work, mail the Editor a snapshot of it.

A GIBRALTAR (*left*) among quarry blocks. Here's a man's size chunk of pink Deer Isle granite, broken out in a single 2,000-ton piece at the Stonington (Maine) quarry of the John L. Goss Corporation, of Boston.

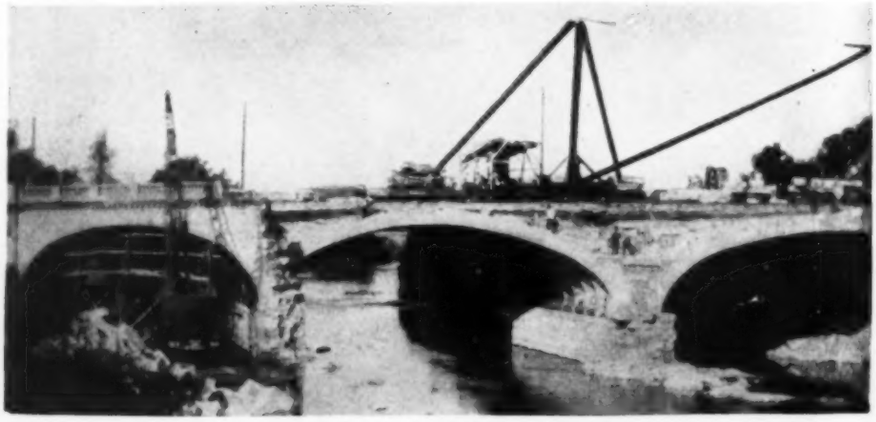
Contractor Damaged of Masonry

SETTLEMENT of the upstream nose of the north pier resulted from scouring at the base. The drop of 3.3 ft. caused the stone arch rings resting on this end of the pier to fail.

THE College Avenue Bridge over Fall Creek, Indianapolis, Ind., was of a unique design which permitted replacement of a damaged portion of the structure without disturbance to the rest after partial settlement of one pier had caused the failure of several ribs in two of the stone arch spans. Each of the three arches was composed of fourteen stone ribs which were offset on the piers and abutments to allow for the skew of these substructures. The photographs show the unusual features of the design.

The piers rested on wood piles. Dredging and floods over a period of 20 years had lowered the bed of the creek about 10 ft. and had undermined the upstream nose of the north pier. This end of the pier settled a total distance of 3.3 ft. in several months' time. Cracks appeared in the pier and in the arches, and the ribs on the upstream side of the bridge bulged out of line. Ring stones in these arch ribs were crushed at the haunches remote from the pier.

The Edward F. Smith Company, Indianapolis, contracted to repair the structure and engaged the Mead-Balch Construction Company of the same city to perform the reconstruction work. To reach both of the arches which were partially to be replaced,



DEMOLITION of condemned sections was carried on by stiff-leg derrick erected over the pier which failed, and by a crawler crane in the creek.

DAMAGED PORTION of pier and arch spans was removed.

STONE RIPRAP laid level for a distance of 8 ft. from the face now protects piers from scour.

Replaces Portion Arch Bridge

DROP HAMMER and dynamite were used to knock out the ribs. Note how ribs are offset on pier to allow for skew. Ribs run parallel with center line of roadway.

the contractor erected a stiff-leg derrick on the sound portion of the bridge over the pier which had failed. A gasoline crane in the creek on the upstream side of the bridge gave some aid in the demolition of the condemned ribs.

By letting a 2,300-lb. drop hammer fall on the keystone and haunches, the wrecking crew knocked out the two exterior ribs of the center arch. It then was an easy matter to remove the two outside ribs of the north span. Four more ribs were taken out of each span by blasting and using the drop-hammer.

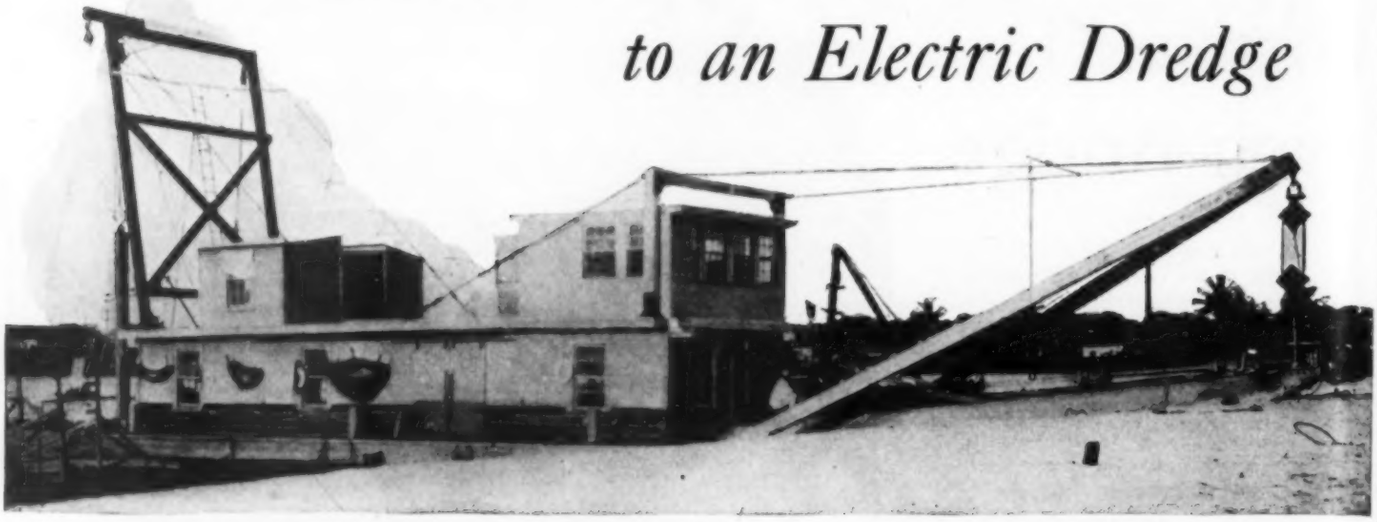
To assure a firm bearing for the new pier section, 71 wood piles from 16 to 33 ft. long were driven with a steam hammer, and the base of the pier was placed 14 ft. below low water. The rebuilt portion is concrete faced with stone. The upstream nose of the south pier, extending beyond the arches, was rebuilt in the same way on a new foundation of 28 piles. Stone riprap laid level for a distance of 8 ft. from the face of the two piers gives further protection against scouring.

A ½-yd. paving mixer prepared the concrete for the arches, and the derrick placed it with a bottom dump bucket. This combination completed the 162 yd. of concrete construction on the center span in 9½ hours. The fill was made with gravel, stone, and sand, washed in, and the spandrels of the arches were faced with stone.

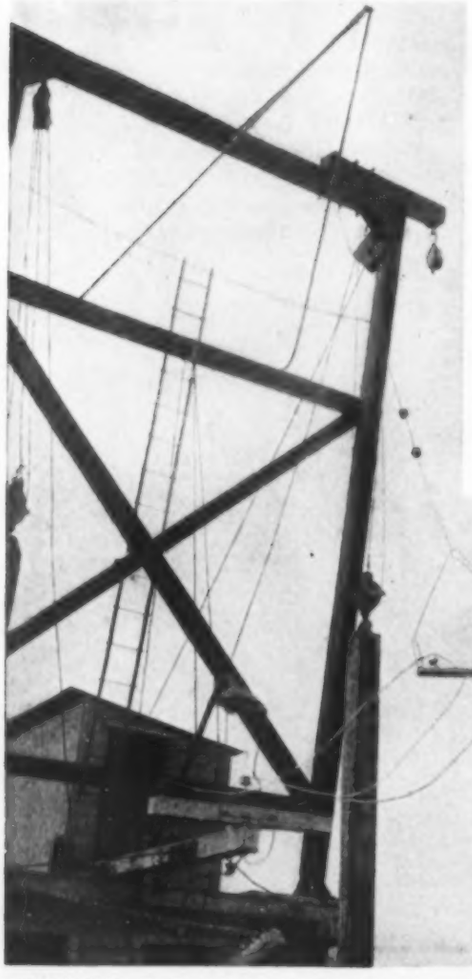
G. R. Harr supervised operations for the Edward F. Smith Co., and Vester McGee was in charge for the Mead-Balch Construction Co.

ERECTING FORMS for concrete arches to take place of six ribs removed from each span. True arch design was modified to preserve lines of masonry structure.

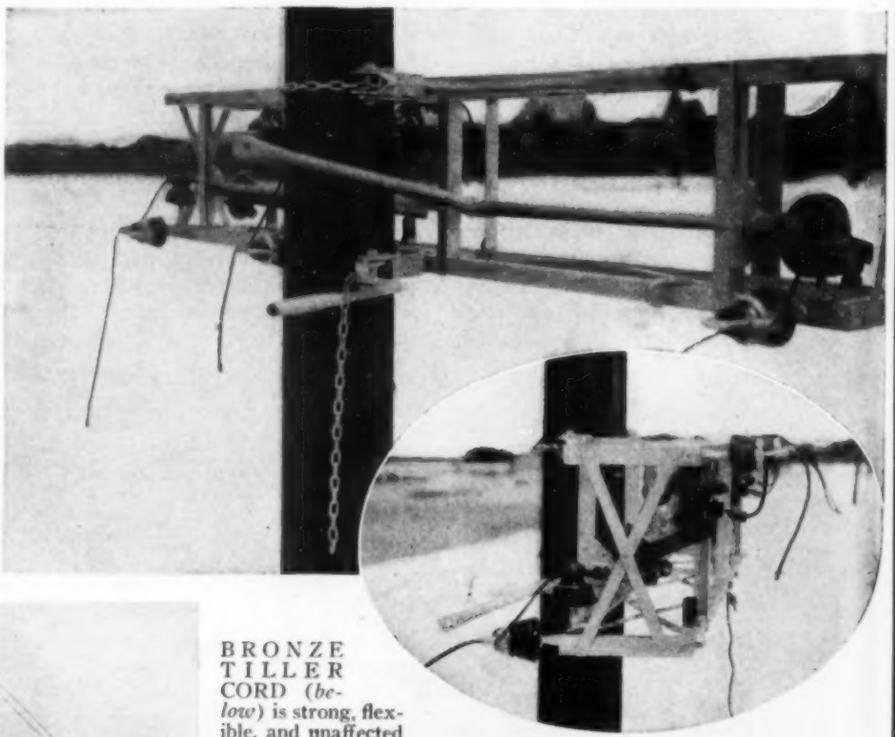
CARRYING POWER
to an Electric Dredge



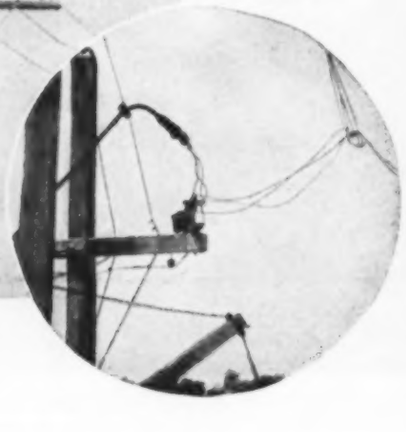
ELECTRIC DREDGE of the West Palm Beach (Fla.) Water Co. operates over a wide area in excavating reservoirs and canals. When carrying on these operations, the high tension (4,160 v.) power line must be constantly extended on shore to keep up with the dredge. From shore to dredge the line is carried by vertical poles mounted on pontoons.



SWINGING CROSSARM on tail piece of dredge is pin-mounted to rotate through 270 deg. Suspended crossarm, balanced by weights, keeps constant tension on three wires. Connection from swinging crossarm to pothead is bronze tiller cord, not copper cable.



BRONZE TILLER CORD (*below*) is strong, flexible, and unaffected by oxidation.



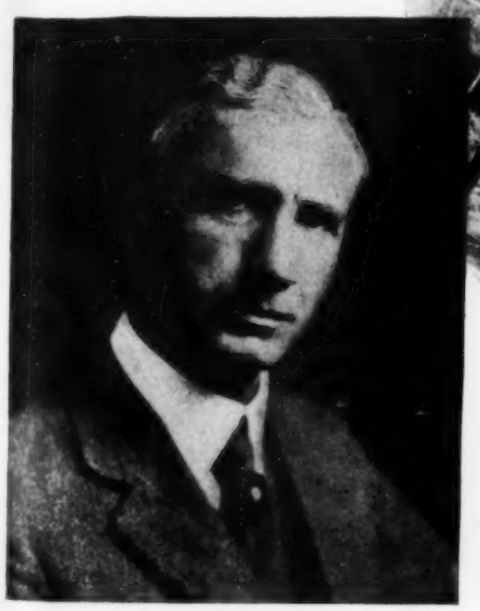
PORTABLE DISCONNECTING SWITCH, made by Captain Charles Meyers from material in water-works shop, is easy to erect and operate. Two disconnecting switches are used in carrying line ahead. Workmen throw out main switch at water-works and disconnect the line again at portable switch nearest plant. They then remove second switch from its position on a pole, transferring wires to insulators on crossarm, and move switch to new pole where line connections are made on ground before switch is lifted by rope and pulley and fastened to pole with chain-and-lever clamps. Switch is operated by lever which controls three single-throw disconnecting switches. To open or close switch in elevated position, man on ground inserts hook at end of a long rod into hole in this lever. Strain insulators made from vertical insulators by pouring babbitt between insulator and pin.

Present and Accounted For —

A Page of Personalities

THOMAS T. FLAGLER, new president of the Associated General Contractors, issued the call on July 15, 1918, which brought together a number of prominent general contractors at Atlantic City and led to the formation of the association at Chicago on Nov. 20, that year. He is president of the Flagler Co., Atlanta, Ga.

HARRY D. WILLIAR, JR., is now chief engineer of the Maryland State Roads Commission. He has been associated with the state roads commission for about thirteen years, during which time he has filled various positions, the last previous to his present appointment being that of assistant chief engineer.



FREDERIC A. REIMER, who will be installed as president of the American Road Builders' Association on May 3, has been a member since 1911 and has served for a number of years on the executive committee. He is a consulting engineer with his office in East Orange, N. J.

© De Bevoise

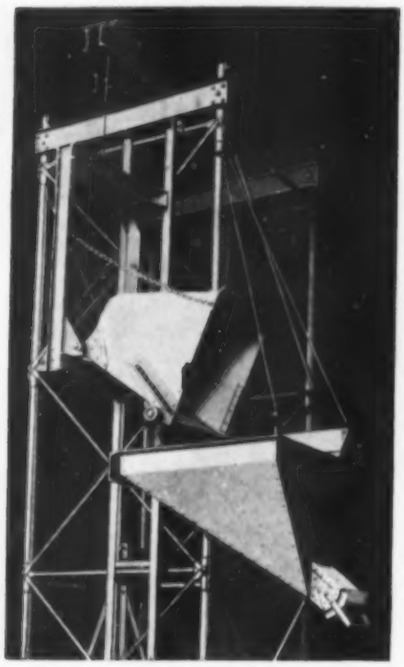
MAE V. CONNOLLY, recently appointed an engineering assistant in the highway department of the Borough of Queens, New York City, is one of the first women to be employed in a practical engineering position by the municipal bureau.

LESLIE R. AMES has resigned as state highway engineer and acting highway commissioner of North Carolina to become state highway engineer of Louisiana. He will supervise the state's hard-surfacing program, which starts with an initial expenditure of $45,000,000.

NEW EQUIPMENT ON THE JOB

Two-in-One-Material Tower

A new tubular tower of the Lakewood Engineering Co., Cleveland, Ohio, does double duty in handling concrete and materials at the same



time. The concrete bucket travels in independent guides on outside of tower and leaves the interior clear for the cage.

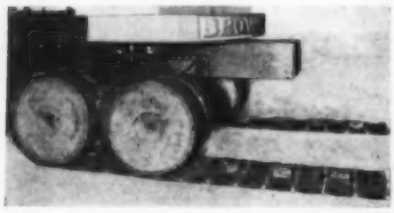
One-Man Grease Pump

The Dot Lubricating Equipment Co., Cambridge, Mass., has introduced a 5-lb. grease pump designed for one-

man operation and equipped with Alemite, Zerk, and Dot nozzles. The pump develops 7,500-lb. pressure without the use of a booster nozzle and with little effort on the part of the operator. It holds enough grease to lubricate two power shovels, three pavers, four tractors, five graders or five trucks with one filling, thus shortening considerably the daily greasing periods.

Eight Wheel Drive for Trucks

The Browning-Christie eight-wheel drive of the Browning Crane Co., Cleveland, Ohio, can be attached to any heavy-duty truck to give it dual utility: truck speed and crawler power. To transform the eight drive wheels into two crawlers, crawler tread belts are placed around the front and rear



pairs of drive wheels. These treads can be attached and removed quickly when it is necessary to use them in traversing extremely soft ground.

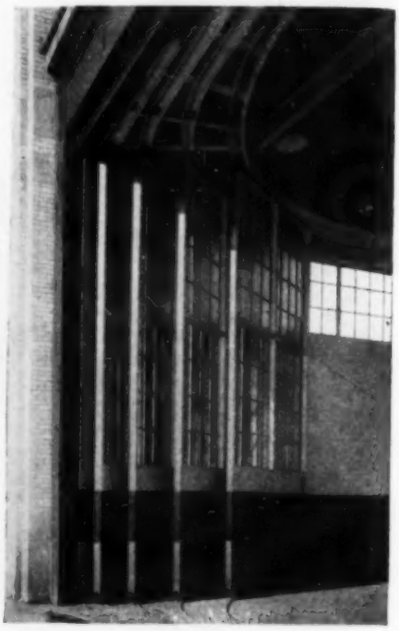
Portable Centrifugal Pump

The Jaeger Machine Co., Columbus, Ohio, has expanded its line to include pumps. A 200-lb. centrifugal pump

mounted on a two-wheel truck frame and driven by a 2-hp. four-cycle gasoline engine equipped with a foot starter has a capacity of 155 g.p.m. against a 10-ft. total head and of 18.3 g.p.m. against a 50-ft. head. It can pump 25 per cent solid matter. Tee coupling, globe valve, and funnel facilitate priming.

Airplane Hangar Doors

Hangar doors built by Truscon Steel Co., Youngstown, Ohio, move on roller-bearing trucks running in tracks. Rails at the top guide the doors. One

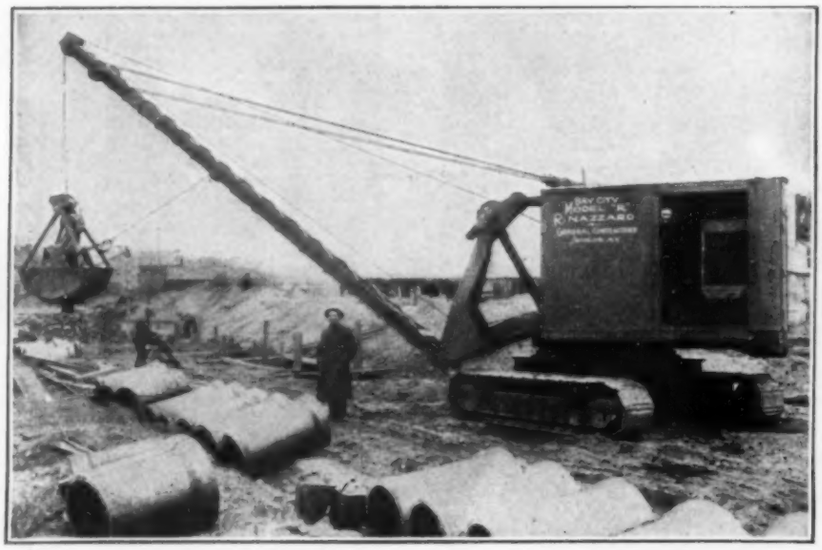


man easily moves 7-ton leaves. Besides the round-the-corner type shown, the company makes straight slide doors.

Rugged Dump Body

Mack Trucks, Inc., New York City, announces particularly rugged standard dump bodies built of No. 7 gage sheet steel, tapered 4 in. from front to rear to insure rapid emptying, and

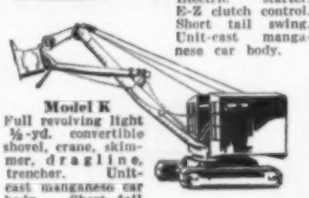
reinforced with numerous underbody cross-members to prevent floor waves and distortion. High headboard and tailgate facilitate use of standard sideboards.



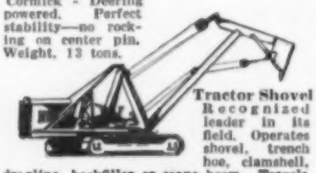
Why is this contractor so happy?

The **BAY-CITY** *family of fast workers*

Model R
A 26-ton, heavy-duty, full revolving ¾-yd. shovel. Operates shovel, clamshell, dragline, trench hoe, skimmer or crane. Electric starter. E-Z clutch control. Short tail swing. Unit-cast manganese car body.



Model K
Full revolving light ½-yd. convertible shovel, crane, skimmer, dragline, trencher. Unit-cast manganese car body. Short tail swing (7 ft.). McCormick - Deering powered. Perfect stability—no rocking on center pin. Weight, 13 tons.



Tractor Shovel
Recognized leader in its field. Operates shovel, trench hoe, clamshell, dragline, backfiller or crane boom. Travels 1 to 4 miles an hour. Weighs 10 tons. Used throughout the country on a wide range of work. Satisfied users are its best salesmen.

Because he is making money on a sewer job by using one of a "Family of fast workers"—the Bay City Model "R," full-revolving, convertible shovel (¾-yd.).

The machine is being used as a combination trench hoe and crane. In this particular installation, the crane boom is attached to the mast extension which is part of the trench hoe attachment. The boom foot is made so that it can be attached to the mast extension to save time in changing attachments.

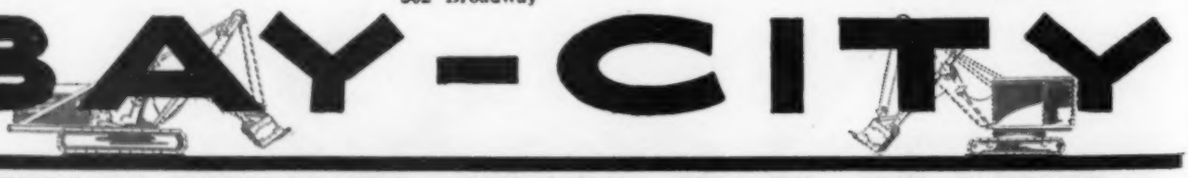
Model "R" is a heavy-duty machine of great power and stability. It has long, heavy crawlers and a unit-cost manganese car body and revolving table. Lifts 10 tons at 12 ft. radius.

For complete specifications write for Catalog R-2.

BAY CITY SHOVELS, Inc.
formerly **Bay City Dredge Works**

New York Office—
302 Broadway

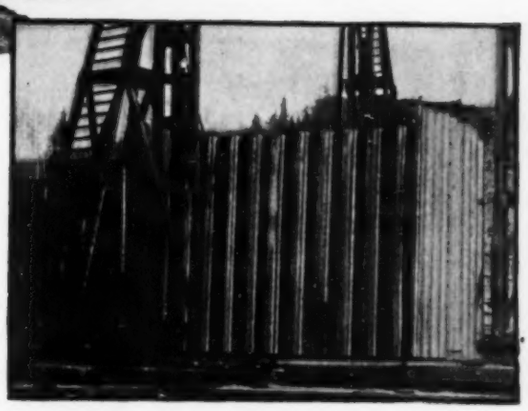
BAY CITY, MICH.



FULL OR PART CIRCLE — SHOVELS — CRANES — EXCAVATORS

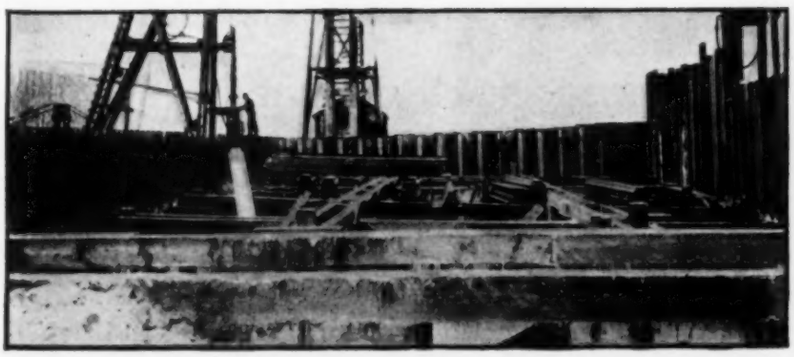
At Nipawin, *Saskatchewan*

Sydney Junkins Company
Contractors



Deep-Arch Section DP 165 LACKAWANNA *Steel Sheet* PILING

was used in Cofferdams for piers of the Canadian Pacific Railway Bridge at Nipawin, Saskatchewan.



There are other Lackawanna Piling Sections —Deep-Arch, Arched-Web and Straight-Web—to meet your particular requirements.

Use the coupon to write in for descriptive literature.

Clip!

CM1

Bethlehem Steel Company
Bethlehem, Pa.

Kindly mail me literature describing Lackawanna Piling Sections:

Name .....

Address .....

City .....

State .....

Company .....

BETHLEHEM STEEL COMPANY :: *General Offices:* Bethlehem, Pa.

District Offices: New York, Boston, Philadelphia, Baltimore, Washington, Atlanta, Pittsburgh, Buffalo, Cleveland, Detroit, Cincinnati, Chicago, St. Louis, San Francisco, Los Angeles, Seattle, Portland and Honolulu.

Bethlehem Steel Export Corporation, 25 Broadway, New York City. Sole Exporter of our Commercial Products.

BETHLEHEM

What's Mine is My Own

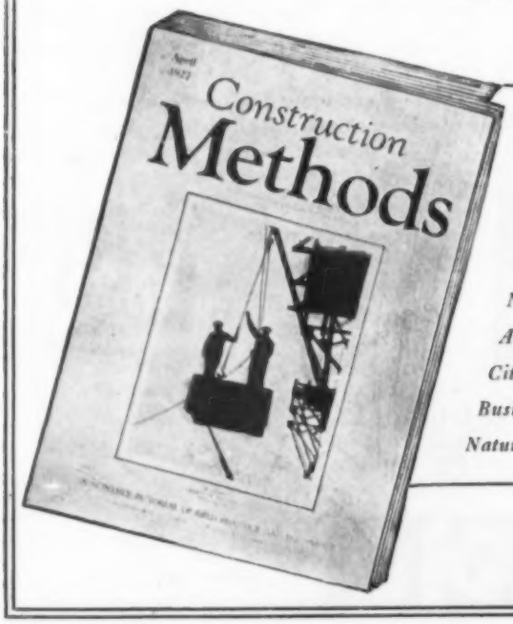
I do with it as I please—when I please—and how I please. I don't have to borrow what's mine—nor must I return it. I share it if I wish—but first and last, it's mine—for my own use.

My copy of *Construction Methods* comes to me regularly each month. It is the field engineer's most valuable means of keeping in touch with the new developments of modern civil engineering and construction. I need it—and I wouldn't be without it. Nor do I want to read it after others have torn out the most interesting articles for their own use. I want the news complete, and I want it while it's new.

When pictures and items are cut or missing—when you see each issue two weeks late, or not at all—when others have used *Construction Methods'* ideas long before you read about them, you are not getting full value, or the help to which you are entitled through this paper.

You need your own copy. Be sure to get it.

Send the Coupon NOW



CONSTRUCTION METHODS
Tenth Ave. at 36th St., New York, N. Y.

Send me my own copy of Construction Methods each month for the next two years. Here's my dollar bill—sent at your risk.

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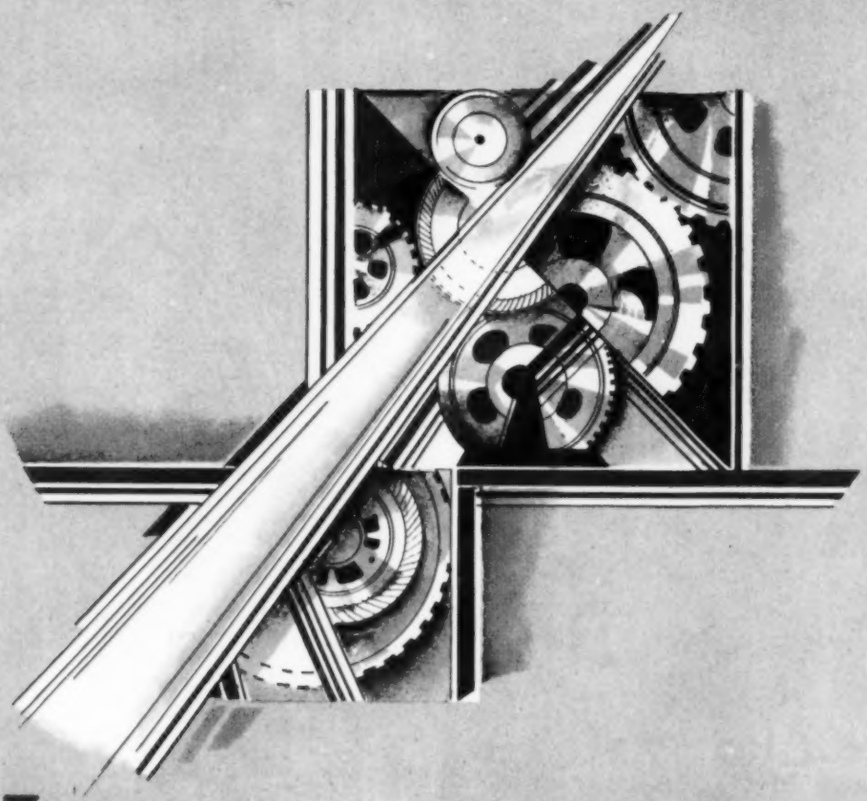
Business connection.....

Nature of Business.....*Title*.....

"MOST MILES FOR YOUR ROAD DOLLARS"



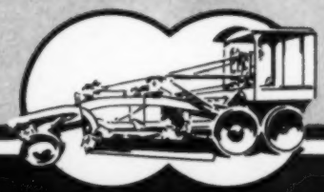
Modern road building is a machine operation

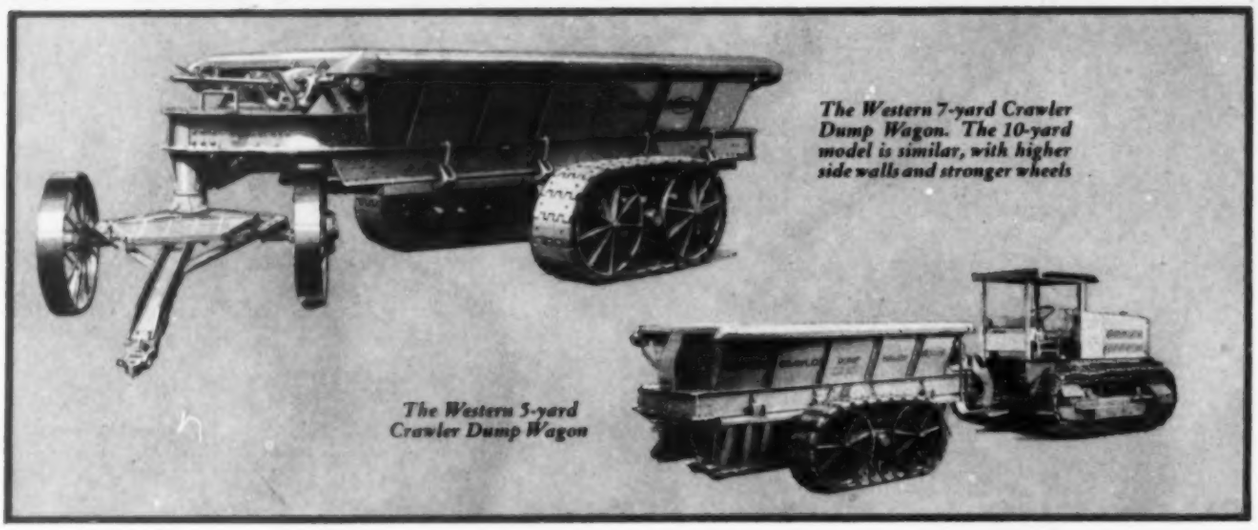
It is true that modern road building is a series of machine operations. Road machinery has made it possible to double the mileage of road building *without increasing the necessary investment, and at greatly reduced operating costs!*

But back of all these "nuts and bolts," important as they are, lies the real truth of what is responsible for this tremendous progress. Makers of road building equipment have for years been forging better and more efficient tools for road builders in the form of time-and-labor-saving machines.

Future progress depends upon the better use of present equipment and the development of new and improved methods. Road machinery design will always keep pace with the needs of highway engineers and contractors.

Austin-Western
ROAD MACHINERY

THE NEW  DUAL DRIVE



The Western 7-yard Crawler Dump Wagon. The 10-yard model is similar, with higher side walls and stronger wheels

The Western 5-yard Crawler Dump Wagon

Western Crawler Dump Wagons

take the "grief" out of the hardest earth handling jobs

WESTERN CRAWLER WAGON loading with an elevating grader—*the cheapest known method of moving dirt.* Unsurpassed for street excavations—levee or railroad embankment building.

THE AUSTIN CONTRACTOR'S SPECIAL ELEVATING GRADER with or without Power Take-Off provides maximum strength, capacity and durability for modern earth moving requirements.

THE WESTERN LEVEE SPECIAL ELEVATING GRADER with engine-driven belt has a greatly increased capacity. Other features are: a new elevator, tongue and re-designed frame.

These crawler wagons with Athey Truss Wheels will go, heavily loaded, wherever a tractor can lead. The 7 and 10 yard sizes are designed to operate behind the most powerful tractors. With their huge loads equal to many ordinary dump wagons carried almost entirely on the rear crawlers—they are the most effective means yet devised for keeping down earth handling costs.

Where the most powerful tractors are not available, there is the 5-yard Western Crawler Wagon with all the features of the larger models except the front wheels. In the 5-yard, the entire load is carried and balanced on the Athey Truss Wheels.

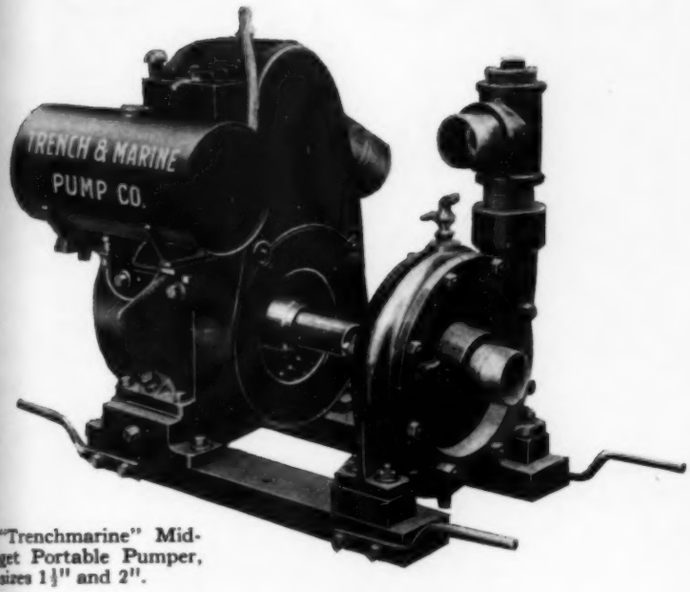
These wagons are sturdily built to stand loading by steam shovel or elevating grader.

THE AUSTIN-WESTERN ROAD MACHINERY CO.

400 North Michigan Avenue, CHICAGO, ILLINOIS—Branches in principal cities

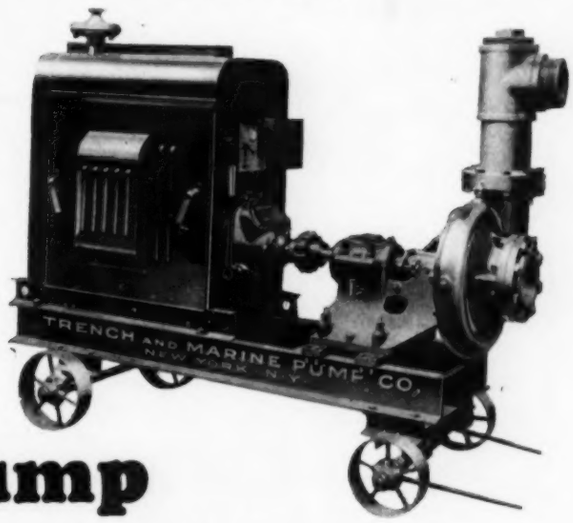
Leaning Wheel Graders, Straight Wheel Graders, Motor Graders, Elevating Graders, Crawler Dump Wagons, Scarifiers, Rock Crushers, Portable Conveyors, Rollers, Motor Sweepers, Sprinklers, Road Oilers, Hot Patch Portable Asphalt Plants, Plows and Scrapers

TRENCHMARINE
Portable Pumps



"Trenchmarine" Midget Portable Pumper, sizes 1½" and 2".

"Trenchmarine" Diaphragm Ball Valve Lift and Force Pump, single and double models—sizes 3" and 4".



"Trenchmarine" Heavy Duty Centrifugal Pump—sizes 2½" to 10", inclusive.

Pumps That Pump

There is a "Trenchmarine" pump for every purpose—priced reasonably—and built oversize for long hard service. Ask your supply house for information concerning "Trenchmarine" Diaphragm and Centrifugal pumping outfits.

DISTRIBUTORS INQUIRIES INVITED

TRENCH & MARINE PUMP CO.

126 WEST 22ND STREET NEW YORK, N.Y.

American Steel & Wire Company

American Wire Rope

MEASURED in the amount of service received, American Wire Rope is the most economical rope made.

You should get Wire Rope on the basis of service. A rope like American Wire Rope will give you reliable service over a long period of time because it is superior rope.

Consult nearest office. Our engineers will select the right rope for your needs.

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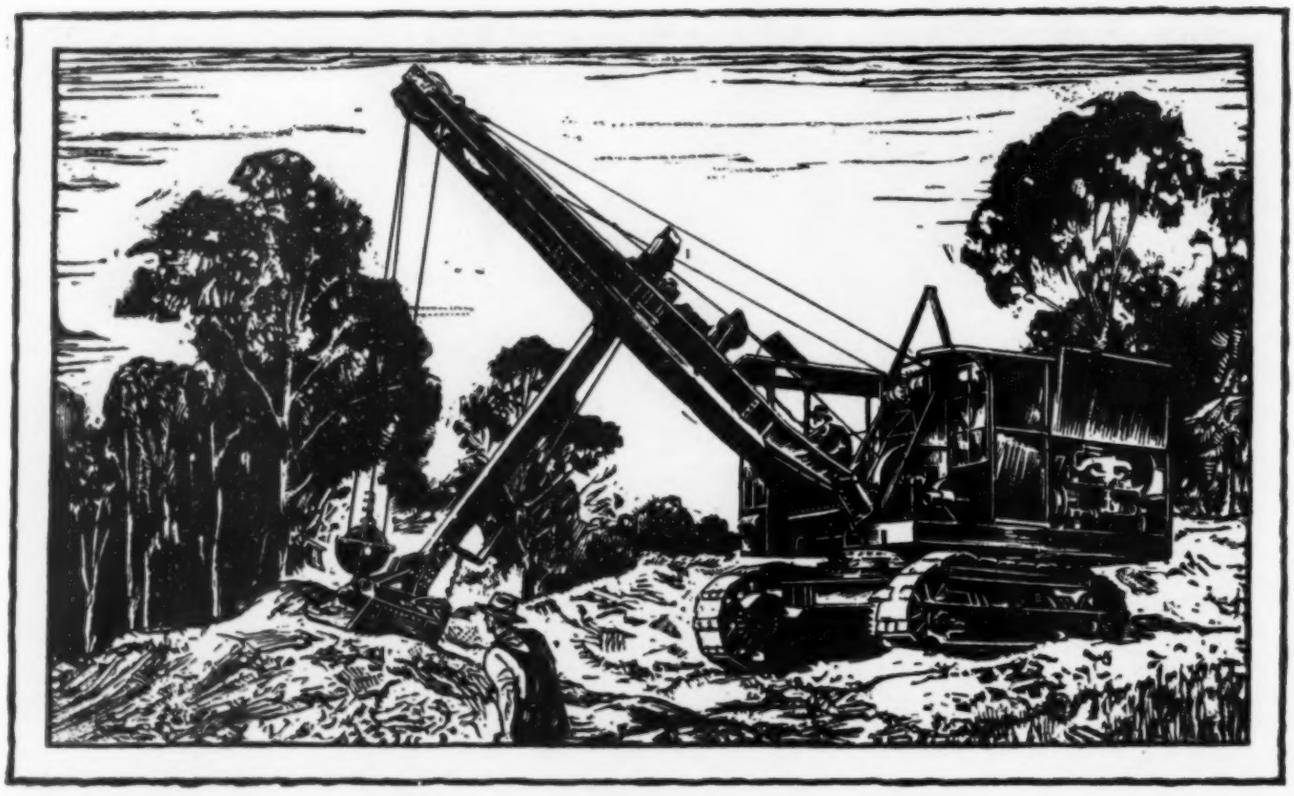
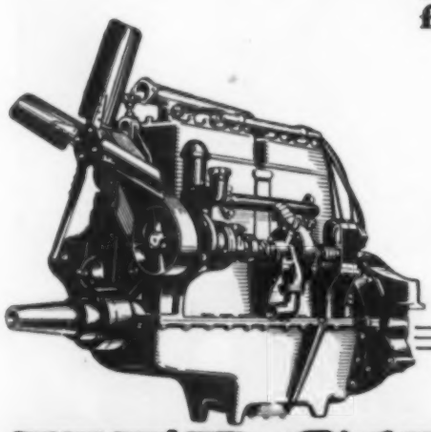


For the Full, Quick Crowd of a One-Yard Shovel . .

FOR a fast start of the swing . . . and a speedy return to digging position . . . for more and *extra* power, the Orton Model G is equipped with a Hercules Heavy-Duty Engine.

Hercules Engines are staunch and sturdy workers—built to outlast and outdo ordinary power equipment. But if servicing is necessary, *the Hercules policy is definite.* It is best reflected by the following quotation from the Orton Crane & Shovel Company—

"We are particularly pleased with the practical application of the Hercules theory that they are really responsible to our customers for their engines."



HERCULES MOTORS CORPORATION
CANTON, OHIO, U.S.A.
West Coast Branch : Los Angeles, Cal.

HERCULES ENGINES

ARC WELDING SWEEPS ON!

AN ALL-WELDED PILE DRIVER

ARC WELDING has scored another triumph. It has given the construction industry an all-welded pile driver that is lighter yet stronger; more rigid; more portable—a structure that can be operated the year around without the expenditure of one cent for the maintenance of loose joints.

This pile driver is one of four made by the Mississippi Valley Structural Steel Company of Melrose Park, Ill., for the Walsh & Masterson Company of Chicago. Night and day, in the Chicago Loop, it pounds away—subjecting itself to terrific vibration—yet to-day, after nine months of service, it is as rigid as the day it was made.

And, again, General Electric arc-welding equipment was used to mark another milestone in the progress of arc welding.

This pile driver is 81 feet high and operates a steam hammer weighing 10,300 pounds. At no sacrifice of strength, the manufacturer showed a 15% saving in material, which greatly increased the portability of the structure.

G-E welding electrodes, when used with G-E arc welders, produce strong, smooth welds at great speed.

THE MORE YOU ARC WELD THE BETTER YOUR PRODUCT

53057

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

—with UNION Hammers

You see here one of two size 2 Union Hammers used by a Denver, Colorado, contractor for driving 31,200 feet or about 6 miles, of actual penetration of steel sheeting, for the Mountain States Telephone Building.

The driving was through very hard, dry, coarse gravel with numerous boulders and some hard shale rock.

It was a tough pile driving job, but was done with satisfaction and dispatch.

Union Hammers are made in 10 sizes—to drive and pull the heaviest piles or lightest sheeting. The surest way to beat down costs is to "drive with Union Hammers."

Send for new 124-page Catalog—"Pile Driving Machinery."

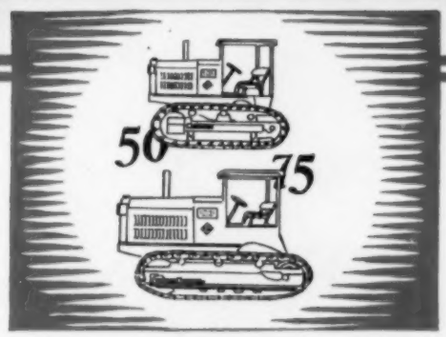
Union Iron Works

Newark and Grove Sts., Hoboken, N. J.

Agents in Principal Cities.
European Agents—Lidgerwood Limited, Friars House, London

UNION
DOUBLE-ACTING
PILE HAMMERS

Balance Counts 100%



THE man who swings a pick knows that balance counts. The mighty elephant that unconsciously bends its bulk and strength forward to pull a heavy load also applies nature's laws of balance through proper distribution of weight. And in a tractor balance is even more important. In the design of the Allis-Chalmers-Monarch the weight of the tractor has been made to fall well ahead on the tracks. *Well ahead,* in order that when the Monarch lends its might to a job its whole weight as well as all of its power is pulling with full efficiency.

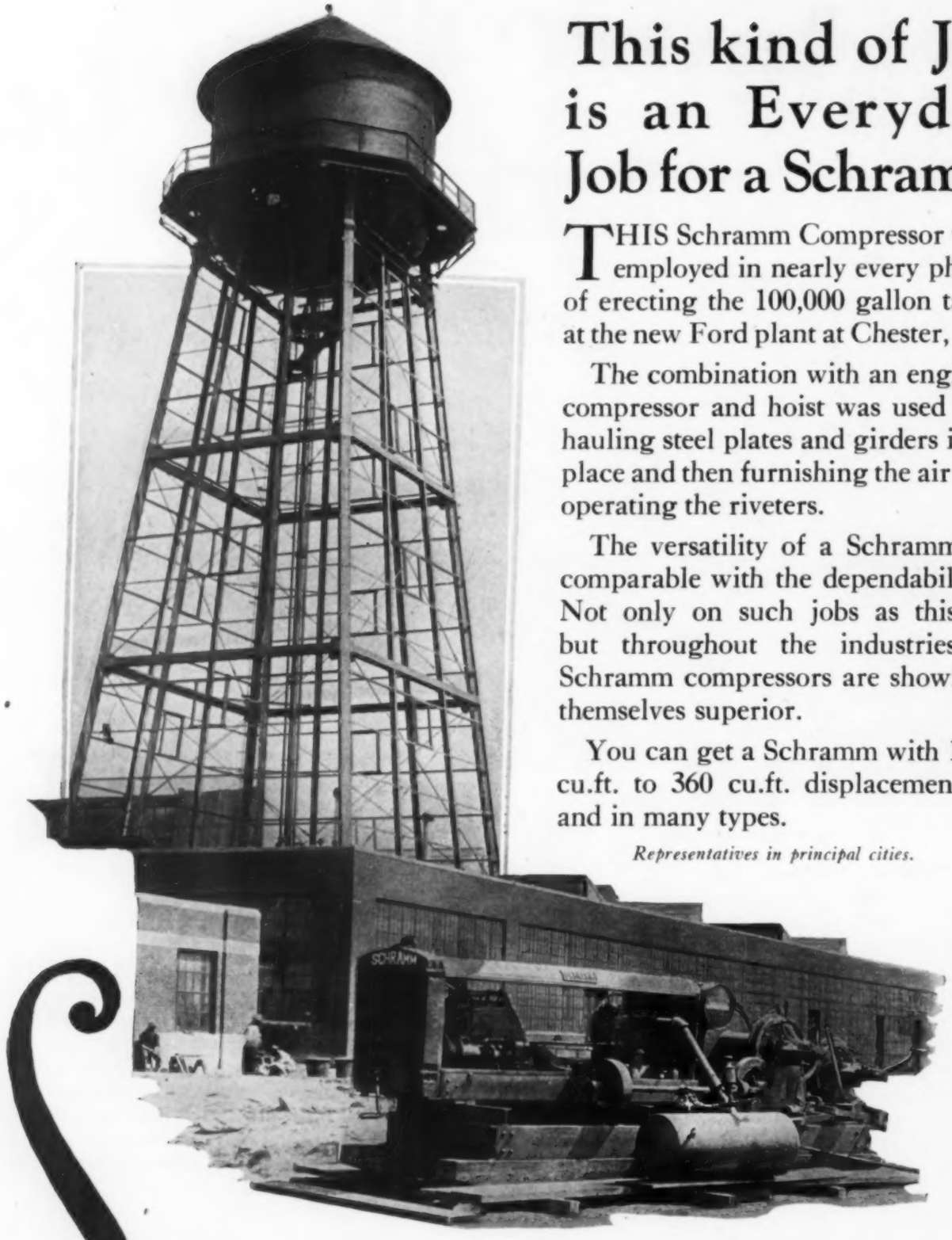
Yet, this is just one of the many features now provided on this great tractor. The Pur-O-Lator . . . . the air cleaner . . . . the master clutch and steering clutches operating with low pressure per square inch on the surface . . . all these things and many others are furnished as part of the Allis-Chalmers-Monarch, without extra charge. They cost more to provide — but they are worth more, resulting in greater owner satisfaction.

ALLIS-CHALMERS MANUFACTURING CO.
Monarch Tractors Division Milwaukee, Wisconsin

FIFTY
Price $3540.00
SEVENTY-FIVE
Price $5350.00
F. O. B. Springfield, Illinois

Monarch Tractors

PRODUCT OF
Allis-Chalmers



This kind of Job is an Everyday Job for a Schramm

THIS Schramm Compressor was employed in nearly every phase of erecting the 100,000 gallon tank at the new Ford plant at Chester, Pa.

The combination with an engine, compressor and hoist was used for hauling steel plates and girders into place and then furnishing the air for operating the riveters.

The versatility of a Schramm is comparable with the dependability. Not only on such jobs as this — but throughout the industries — Schramm compressors are showing themselves superior.

You can get a Schramm with 1¾ cu.ft. to 360 cu.ft. displacement— and in many types.

Representatives in principal cities.

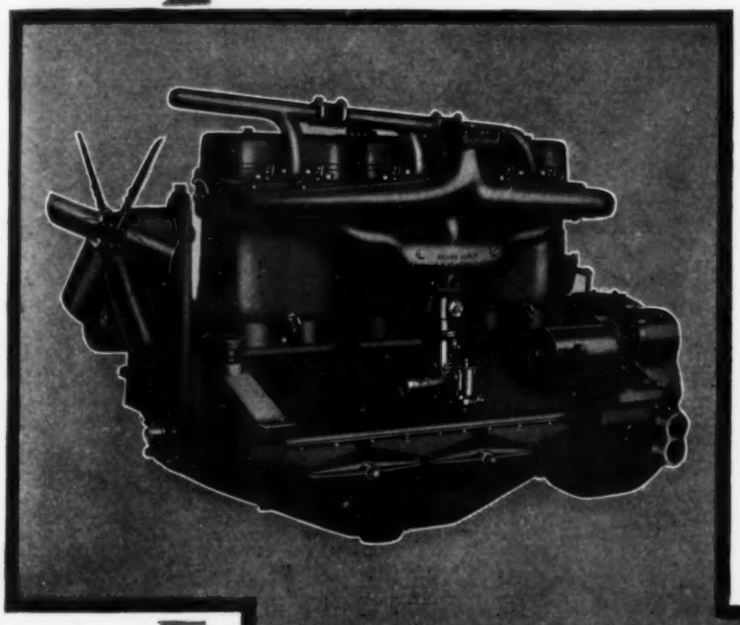
Schramm Inc.

West Chester
Penna., U. S. A.

THERE'S ACTION

WHERE LE ROI ENGINES WORK

3 to 170 HORSE POWER



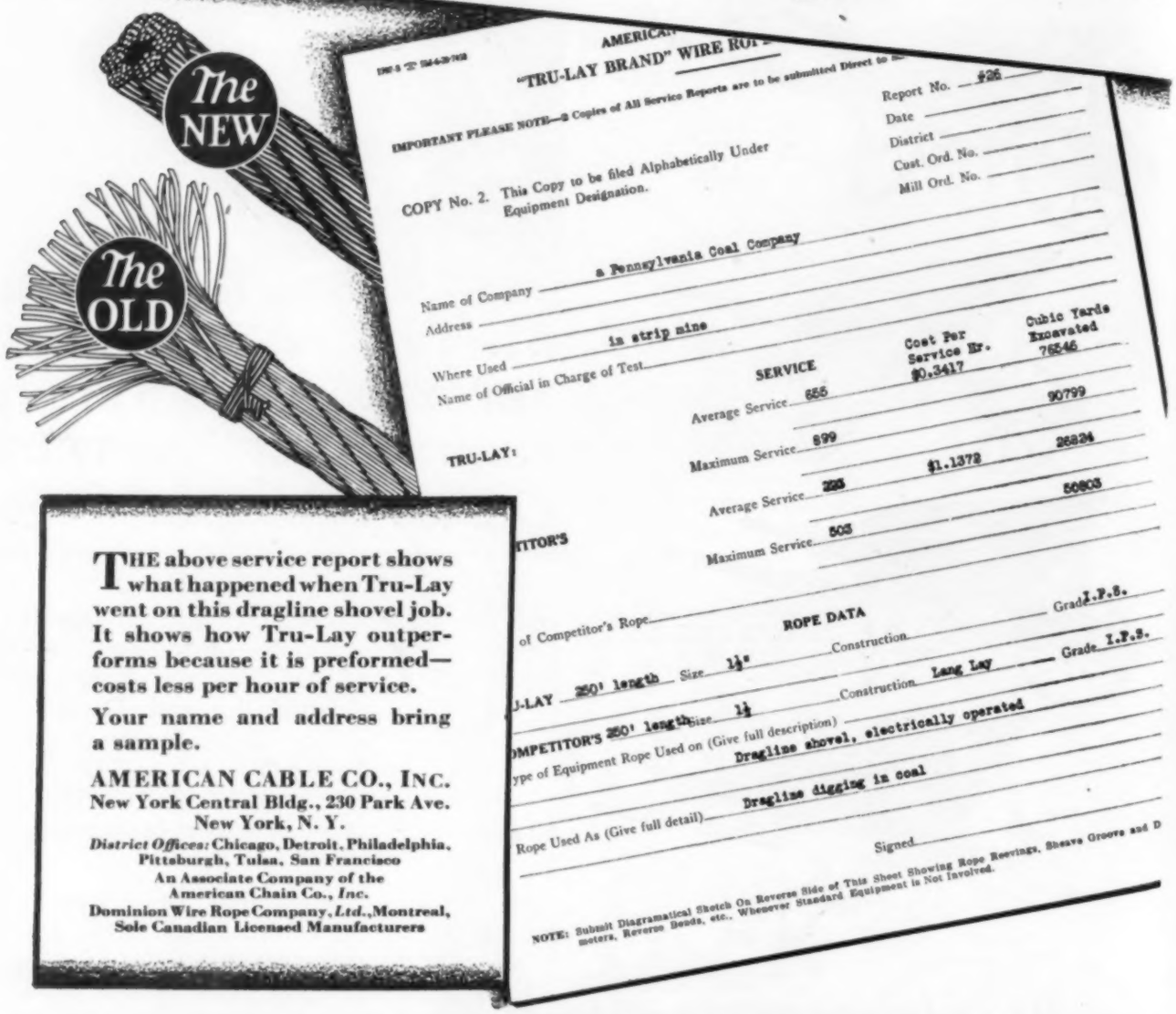
THERE'S snap and life—*action always*—where Le Roi Engines are operating. They furnish the *spark* and set the *pace*—a pace that's partial to contractors' profits!

All Le Roi Engines are chucked full of *pep*. And because of their "liberal" ratings, they furnish *surplus power, smoother power* and more *economical power.*

Know the Le Roi by its field performance—it is an engine of unusual merit.

LE ROI COMPANY · MILWAUKEE, WIS.

We cut our costs 79 CENTS AN HOUR



THE above service report shows what happened when Tru-Lay went on this dragline shovel job. It shows how Tru-Lay outperforms because it is preformed—costs less per hour of service.

Your name and address bring a sample.

AMERICAN CABLE CO., INC.
New York Central Bldg., 230 Park Ave.
New York, N. Y.

District Offices: **Chicago, Detroit, Philadelphia, Pittsburgh, Tulsa, San Francisco**
An Associate Company of the American Chain Co., *Inc.*
Dominion Wire Rope Company, *Ltd.*, Montreal, Sole Canadian Licensed Manufacturers

PREFORMED WIRE ROPE

TRADE **TRU-LAY** MARK

(Reg. U. S. Pat. Off.)

132 Well Points
Operated by One
BARNES
Plunger Trench PUMP!

PROOF of the dependability of the Barnes Plunger Trench Pump is shown by the performance of a model L-308-A Plunger Trench Pump operated by the Nelson Building Construction Company, Chicago.

Pumping steadily day and night for 24 days, and at times handling 132 points, this sturdy Barnes kept the excavation illustrated above dry at all times. There was plenty of water to handle as the job, located on Lake Shore Drive, Chicago, is right on the Shore of Lake Michigan. The area of the job was over 10,000 square feet, the footings 12 feet below grade, and the points about 9 feet below lake level.

It is significant of Barnes quality that this pump has been in steady operation for the Nelson Building Construction Company since April, 1927. During this period there has never been a breakdown or new part furnished for this pump.

Steady, dependable operation is built into all Barnes Pumps. Let us tell you more about them. *Mail the coupon below today.*

The BARNES MANUFACTURING CO.
Mansfield, Ohio

The Barnes Manufacturing Company,
923 Main Street, Mansfield, Ohio.

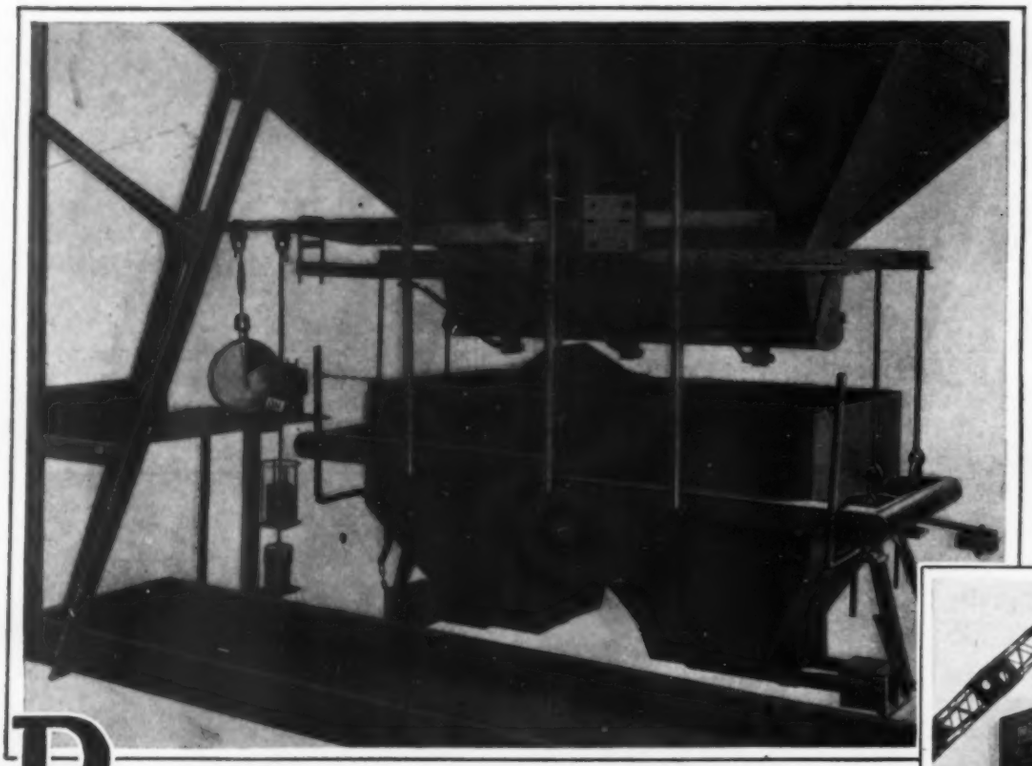
Please send me complete information about Barnes Plunger Trench Pumps for dewatering excavations in sand.

Name .....

Address .....

City .....

State .....



While normally equipped with a movable weight type scale, the Butler Weighing Batcher may be furnished with a separate scale beam and movable poise for each material to be weighed. Where desired, a full-capacity, dial-type scale can be furnished.

Butler weighing batcher with *All-Steel* Scale

THE New Butler Weighing Batcher is simple in construction and easy to operate.

It has fewer working parts than other weighing batchers and is most easily handled in shipping for it ships completely assembled and may be attached to any bin — wood, concrete or steel.

The scale is All-Steel and is arranged to weigh one, two or more aggregates with the same mechanism. A trigger weight control puts weights for each material in position as needed. A simple tell-tale dial shows overweight or underweight. The scale is equipped with an oil dash-pot to regulate sensitiveness. Direct operated radial gates and counterweighted, automatic opening and closing discharge gates, provide instant and positive control.

Study the advantages of this new Batcher before you purchase equipment for this season's operations.

BUTLER BIN COMPANY, Waukesha, Wis.

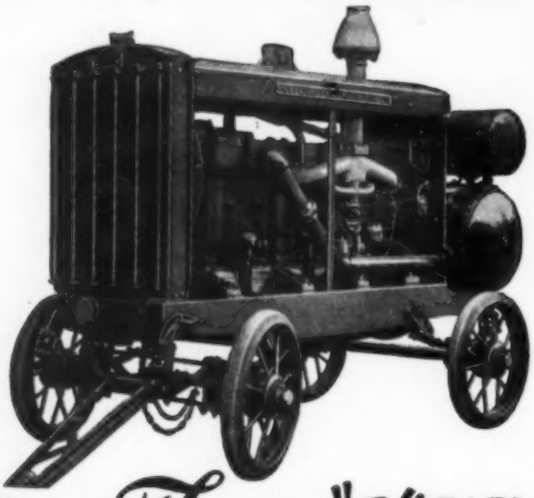
Representatives in *Fifty Principal Cities*

BUTLER
Steel **BINS**

BUTLER BIN COMPANY · WAUKESHA, WIS.

WHY WASTE PISTON STROKES?

Thor Puts Them to Work for You



The Thor "6" With Super Charger Gives You 26% More Air

In all compressors but the THOR, there is an idle stroke—the downward stroke—which does not compress air. These idle strokes ***increase your costs*** and ***help to drain your profits.***

In the THOR SIX Air Compressor, the idle or downward stroke is put to work by means of the Rix Super-Charger. This exclusive, patented feature utilizes the idle stroke of the piston to compress the additional air the THOR delivers.

The THOR SIX Air Compressor delivers more air than any other compressor of the same size because it does not waste piston strokes. The THOR 116 ft. rated capacity compressor actually delivers 96 ft. of air per minute. The THOR 250 ft. rated capacity compressor actually delivers 210 ft. of air per minute. Take any other compressor and compare its rated capacity and actual delivery of air with THOR performance and you will realize why the THOR is the best compressor buy on the market.

On the basis of "more air for your money" the THOR deserves an investigation on your part. Get the facts before you buy. Compare results—check performances—and then decide. You'll find that you'll be money ahead.

We also make a complete line of Paving Breakers, Clay Diggers, Backfill Tampers, Calking Hammers and Concrete Surfacing Grinders. Write for literature.

It's the air "actually delivered" by a compressor that runs your tools and not the "rating," "capacity" or "piston displacement." Air "actually delivered" is the most important feature in buying compressors.

INDEPENDENT PNEUMATIC TOOL CO.

PNEUMATIC TOOLS

246 South Jefferson St.
Chicago, Ill.

ELECTRIC TOOLS

just one STOCKLAND SUPERIOR ~ FEATURE ··

FOOTE BROS.

Established 1859

3 POINT ~~~ SUSPENSION OF FRAME

HERE is your protection against twisted—strained—stretched and broken grader frames. The front end of the Stockland frame is mounted on a rocker plate allowing the front trucks to rock from side to side.

This design eliminates broken frames, sheered bolts, loose parts and other troubles.

AND this is only one of the many features of Stockland Design superiority. Others are: Cut, Lift, Roll, Blade—Low Center of Gravity—Balanced Blade Location—Heavy Double Frame Construction—84 Fewer Working Parts than any other grader.

ROLLS
LIFTS
CUTS

Send for this book with all the Stockland superior features.

C.M.S. 103

FOOTE BROS. GEAR & MACHINE CO.
256-260 No. Curtis St., CHICAGO, ILL.

Please send me the Stockland "Grader Book"

Signed_____

Address_____

FOOTE BROS. GEAR & MACHINE CO.

Road Machinery Division

256-260 N. Curtis St. Chicago

Sales and Engineering Offices in All Principal Cities, U.S.A. and Canada

Chain with the Extra Muscle

There is an extra flash of reinforcing material on every link of "Inswell" Chain—an extra muscle of steel that strengthens the weld.

This means a chain with a weld as strong as the stock. And for your protection all "Inswell" Chain is branded with the initials "C-M."

Order "Inswell" for your next construction job.

COLUMBUS-McKINNON CHAIN COMPANY

General Sales Office: Tonawanda, N. Y.

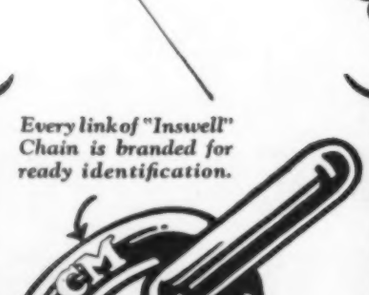
Plants:

Tonawanda, N. Y. Columbus, Ohio

In Canada

McKinnon-Columbus Chain, Ltd.
St. Catharines, Ont.

Every link of "Inswell" Chain is branded for ready identification.



The "Inswell" link is 25% stronger at the weld.

"INSWELL" ELECTRIC WELD CHAIN

$20,136 Earned In 8 Months

THIS excavating and steel erecting job is typical of those done by the 3 Universal Cranes of an Ohio Crane Service Company in earning $20,136 in the last 8 months of 1928.

In doing so they did 87 jobs, some long ones, some only a few hours—and travelled a total of 3550 miles in serving an area covered by a 100 mile radius.

In every locality there are hundreds of jobs of all types where time is to be saved and money is to be made by use of proper mechanical equipment. The Universal Crane supplies just the all-purpose flexibility needed for such jobs. Its motor truck mounting furnishes just the speedy cruising ability required to reach such jobs, at practically no moving costs in time and money. Universal daily earnings run $50 to $100 a day per machine.

If an additional $10,000 to $20,000 per year interests you, write for the explanatory details today. Universals are equally profitable on bigger jobs and operations, as evidenced by 25 New York Subway contractors who own 48 Universals used to cut costs and speed up operations. Ask for Bulletin 36.

THE UNIVERSAL CRANE COMPANY
Lorain, Ohio

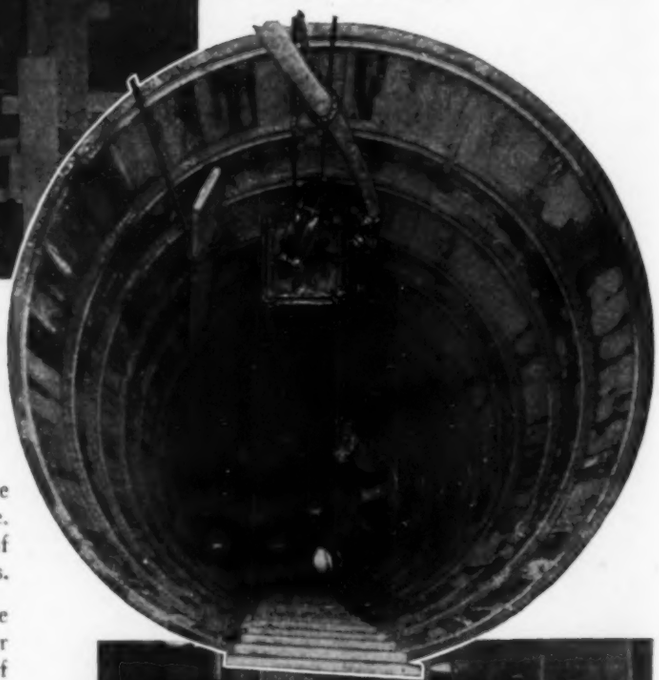
***The* UNIVERSAL-35**
Center Drive Crawler Mounted

The 2 speed Center Drive Crawler outmanouvers them all. The Universal superstructure outperforms them all. The ½ yard Center Drive Shovel boom digs and dumps higher.

UNIVERSAL

Air Power Sinks Caissons in Cramped Quarters

At left: The Two Sullivan 220-ft. Vibrationless Portable Compressors which operated the air jets. Center: Looking down one of the caissons. Note pipe hammer for driving the steel tubes.



Sullivan Compressors run 24 Hours Daily

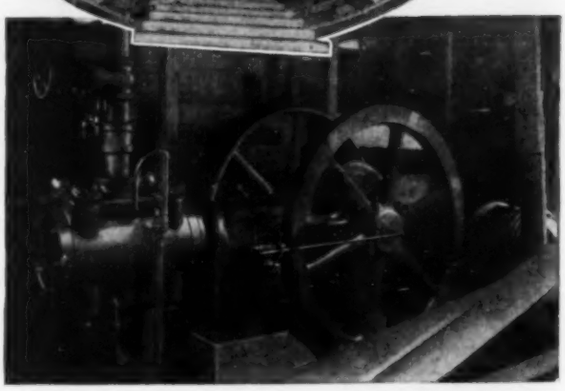
Caissons for the New Ambassador Bridge at Detroit had to be sunk from the interior of the Pere Marquette roundhouse. But the H. H. Esselstyn Company, by a clever application of compressed air, solved the difficulty of cramped conditions.

Steel tubes, 18 inches in diameter, were driven from the bottom of open caissons 60 feet deep—fifty-five feet farther to rock, by air hammers. And the muck was blown out of the tubes by a 2½-in. air jet.

Two Sullivan 11x10 belt driven compressors ran 24 hours daily, supplying air power to drive the hammers. Two Sullivan "Vibrationless" Portable Compressors ran night and day to operate the air jets.

The tubes were filled with concrete, the open 8-ft. caisson reinforced and filled, and the finished pier was ready for a load of 816 tons. Two to three weeks were required per caisson.

Simplicity and compactness of air power equipment made quick work possible in small space. Trouble-free 24-hour service furnished by Sullivan Compressors—reduced overhead.



One of the two Sullivan single stage belt driven compressors. Type "WG-6", which operated the air hammers.

Write us for the full story, and information on Sullivan Air Power Equipment.

SULLIVAN TRADE MARK

SULLIVAN MACHINERY COMPANY
816 WRIGLEY BLDG., CHICAGO

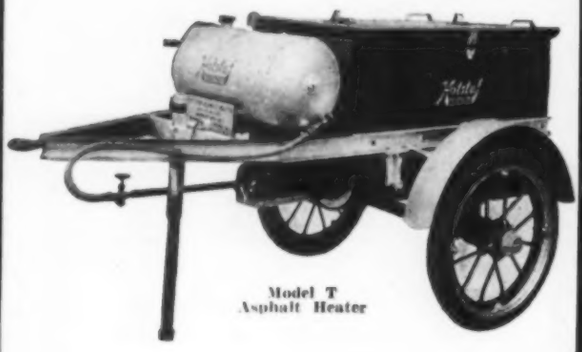
Hotstuf

TRADE MARK REG.

ASPHALT HEATER

with Patented Elevated Melting Chamber

produces 30 per cent to 50 per cent GREATER MELTING EFFICIENCY and ECONOMY

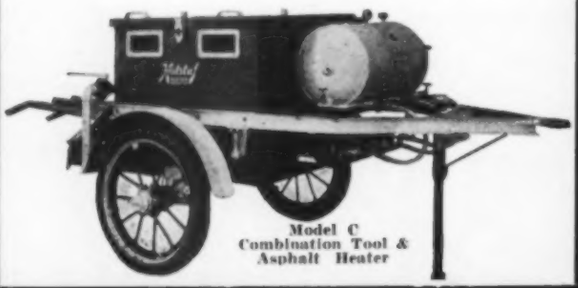


Model T
Asphalt Heater

The Hotstuf Asphalt Heater is especially adapted for road contractors, state highway and city street departments. This heater has approximately double the melting capacity of the old style wood burning kettle, and eliminates the smoke nuisance and fire hazard.

The No. 50 Heater mounted on wheels is especially suitable for patrol work, patching, filling cracks, and resurfacing, and is very economical and convenient to operate.

The Model-C Combination Paving Tool and Asphalt Heater will produce Hot Tools and Hot Asphalt in 5 minutes. Saving approximately $10 per day over old style fire wagon.



Model C
Combination Tool &
Asphalt Heater

MOHAWK ASPHALT HEATER CO., Schenectady, N. Y.

Please tell me more about the Hotstuf Asphalt Heater.

Name .....

Address .....

I am a Contractor ☐ I am a Distributor ☐

The "AUTOGRADER"

Drive it like a truck—and as easily handled!

RED SEAL CONTINENTAL MOTOR built *into* the grader, an entirely self contained power grading unit. Equipped with wheels or crawlers and scarifiers. Get Bulletin KAG, descriptive of this exceptional machine.

Good Roads MACHINERY

Motorized Graders, Bituminous Pressure Heating Distributors, Cold Oil Distributors, Road Rollers, Snow Removal Equipment, Champion and Climax Rock Crushing Equipment, Sand and Gravel Equipment, the installation of complete plants.

THE GOOD ROADS MACHINERY CO., INC.
KENNETT SQUARE, PA.

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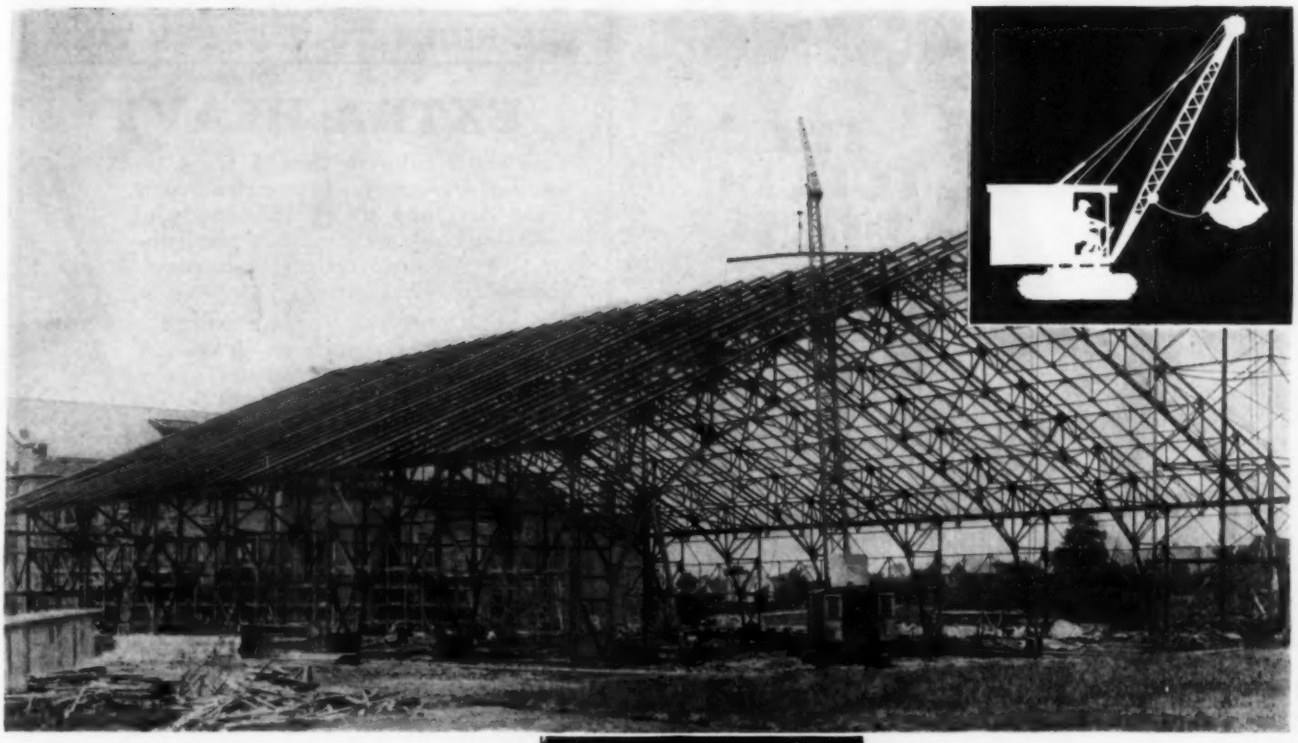
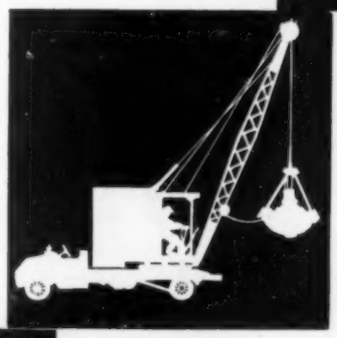
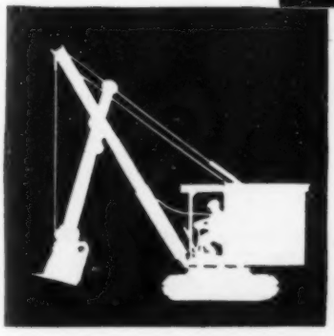
Chicago Los Angeles



A Browning Crawler Crane speeding up the erection of steel work on The University Indoor Athletic Field, Bloomington, Ind.





A Browning Crawler is a full revolving, all-purpose machine—fast, easy to operate, and adaptable to every conceivable type of handling job.

Browning performance means more productive work at a lower handling cost. And there is a Browning that will "fit in" on your job as though "made to order."

The Browning Crane Co., 16226 Waterloo Rd., Cleveland, Ohio, U. S. A.

Branch Offices: **New York, N. Y., Chicago, Ill.**

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BROWNING

LOCOMOTIVE, TRUCK, AND CRAWLER CRANES

ANNOUNCING

THE TOLEDO HORSE

PATENT PENDING

It only takes a few seconds to attach these rigid pressed steel frames to any piece of 2-inch standard sized lumber. Unexcelled as highway barricades because of their extreme rigidity, everlasting durability, and the ease with which they can be dismantled, folded up and stored, or moved from place to place. Indispensable around all construction activity. Absolutely safe. Always ready. Convenient to handle.

You will be surprised how inexpensively they will solve this tedious problem. Ask for particulars.

ANOTHER PRODUCT OF THE TOLEDO PRESSED STEEL COMPANY TOLEDO, O.

Makers of

THE TOLEDO TORCH

That better means of protecting construction work at night. Cheaper and more effective than breakable and misleading lanterns. The only torch which gives reliable protection, the year around, regardless of weather. All claims for performance fully substantiated by its users.

Insist on the genuine Toledo Torch with the Economy Burner. Your job deserves this protection at night and no other torch can give it to you at so little cost.

Its flashing yellow signal fully illuminates the danger zone and gets the traveller past quickly and safely.

Use yellow. No other color means caution. And use the Toledo Torch. The harder it blows the better it burns.

THE RIGHT TOOL SAVES TIME

EXTRA HEAVY

This road rake is forged from one piece of bar steel. It is extra heavy, being designed to fill the needs of road builders and paving contractors. Will stand up under hardest kind of service.

An excellent tool for spreading heavy materials such as gravel, crushed stone, and concrete.

This rake has 14 teeth. Head is 3⅞ inches deep, and 15¼ inches wide. Handle is 5½ feet long.

The brand True Temper is burned in the handle to mark each rake as the best tool of its kind that can be made.

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1901 Keith Bldg.,
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Makers of Farm and Garden Tools for over 100 Years

Branded on the handle of every genuine TRUE TEMPER *tool*

If your dealer has not yet stocked the True Temper Steel Road Rake, Cat. No. X14, send us his name and $1.70 and we will supply you direct, postpaid.

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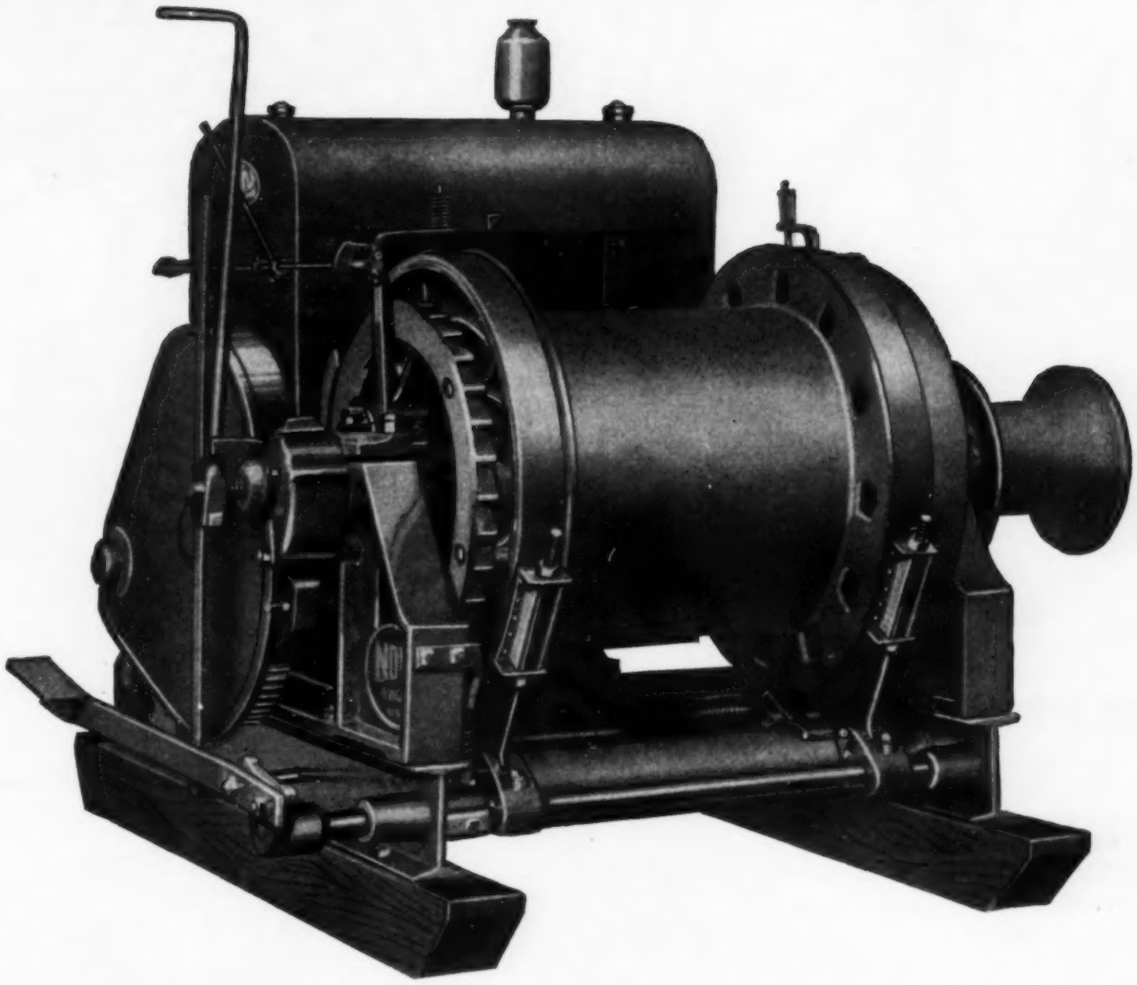
Heavy Steel Goods or Industrial Tool Catalog. Describes over 50 tools for mill, mine, factory and coal yard.

TRUE TEMPER TOOLS

THE NEW HI-SPEED HOIST



For Faster—Safer Material Handling

Here's a brand new Novo Hi-Speed Hoist for the contractor who wants faster bucket and elevator handling—faster lifting of mortar, bricks, and other materials on building construction jobs.

For the large drum, operated by a powerful Novo 4 Cylinder Engine or electric motor, "takes in" and "lets out" the cable at a new high speed that means more loads per hour to the top of the tower or mast.

Double brakes—one at either end of the drum—with friction blocks of a special asbestos composition, give the operator perfect load control at all times.

Write for complete information on the new Novo Hi-Speed Hoists that can speed up your building construction work.

NOVO ENGINE COMPANY, 214 Porter Street, Lansing, Michigan

CLARENCE E. BEMENT, Vice-Pres. and Gen. Mgr.

NOVO

PUMPS—ENGINES—HOISTS

Service, parts and sales in over 70 cities

Starrett Transit No. 99F

Here is a transit and level that any man can use—you need no technical knowledge and it's free from confusing adjustments.

The Starrett Transit No. 99F is simple but efficient for laying out building lots—leveling foundation walls — pouring concrete floors — laying out new roads, or a hundred other uses for the builder or contractor.

The Starrett Transit No. 99F with telescope having lens and eye shutter, long legs and ground level vial costs but $40.00. Economical to buy, but built to the one standard of quality which has made Starrett Tools famous.

A free booklet explaining the uses and illustrating practical problems will be sent to you on request.

Starrett Wood Leveling Rod and Target

Starrett Steel Plumb Bob No. 87

THE L. S. STARRETT CO.
World's Greatest Toolmakers
Manufacturers of Hacksaws Unexcelled
Steel Tapes—Standard for Accuracy
ATHOL, MASS., U. S. A.

Use Starrett Tools

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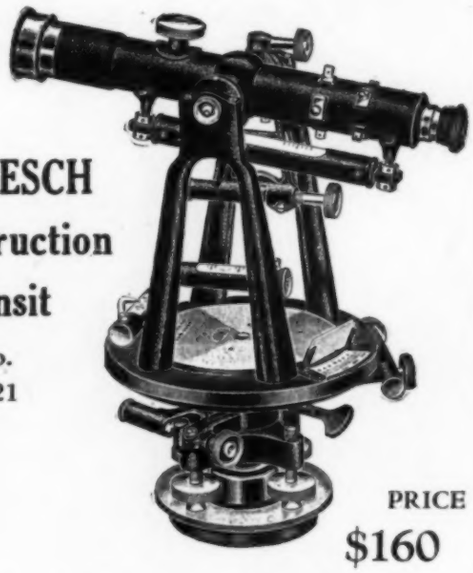
The BEST at *any* Price!

KOLESCH Construction Transit

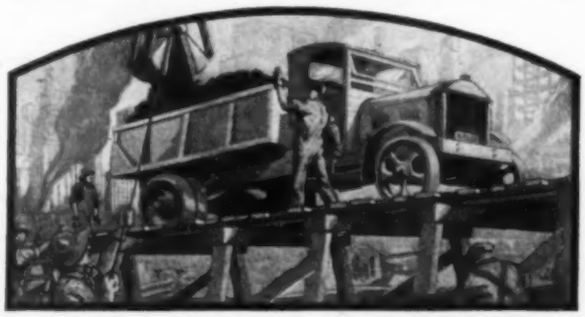
No. 7721



PRICE **$160**

This Transit is designed to meet the most exacting requirements of the Construction Engineer, and is *Kolesch Quality* throughout.

KOLESCH & COMPANY
138 Fulton St., New York, N. Y.
Established 1885



The Ideal Gear Lubricant for Heavy Loads

For truck differential and transmission gears you can't beat Dixon's "677." A specially compounded grease and graphite for heavy duty gears, that will not squeeze out under heavy loads. Its double film prevents metal to metal contact and extends the life of these working parts.

Give your trucks a chance to earn their way by keeping transmissions and differentials always filled with Dixon's "677."

DIXON'S "677"

Jos. Dixon Crucible Co.
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New Steeldeck Roof

Insulated *and* Waterproofed

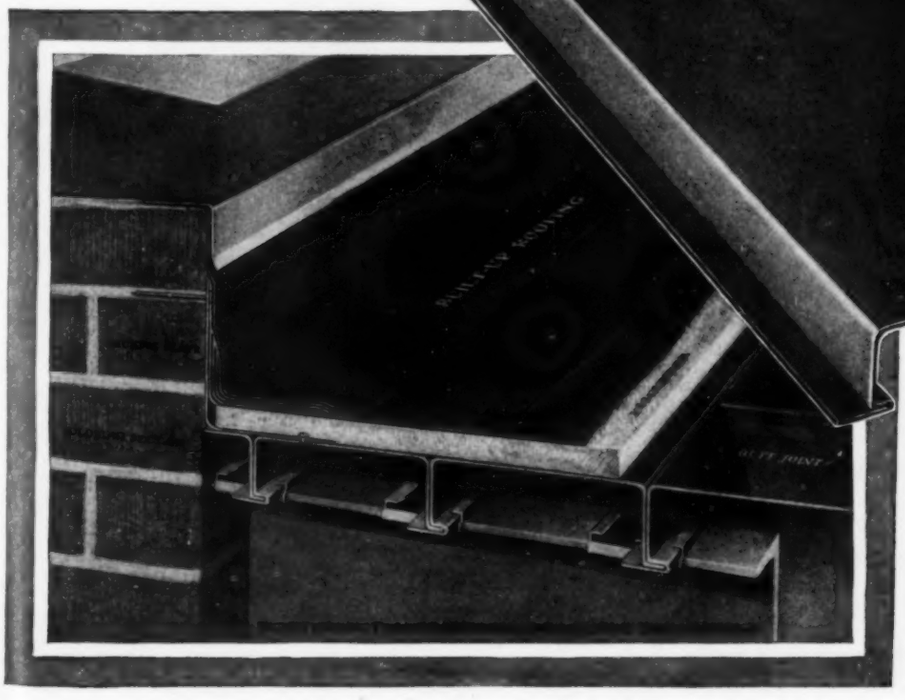
TRUSCON Ferrobord

TRADEMARK REG. & PAT. APPLIED FOR

Here is a quality Steeldeck roof furnished in six-inch wide, easily handled units of any desired length. The Ferrobord units interlock along the sides, forming rigid reinforcing ribs and a smooth unbroken surface free from perforations.

Furnished in 18 and 20 gauge and two depths of ribs, Ferrobord Steeldecks are economical for all practical roof loads or purlin spacings, and are adapted to any shape of roof for any building. They provide a light-weight, permanent, firesafe roof, quickly installed at economical cost. *Write for full information.*

ARMCO INGOT IRON



Truscon Steeldeck Roofs also include I-Plate and Ferrodeck types to meet requirement of new roofs and replacement.

TRUSCON STEEL COMPANY
Youngstown, Ohio
STEELDECK DIVISION

Sales and Engineering Offices in Principal Cities
Trussed Concrete Steel Co. of Canada, Ltd.
Walkerville, Ontario

TRENCH WITH DRY WALLS AND BOTTOM 21 FEET BELOW WATER LEVEL

Absolutely dry trench—21 ft. below water level!

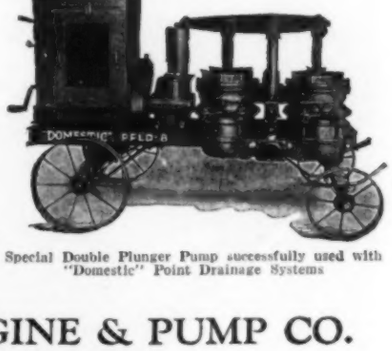
"DOMESTIC" DRAINAGE SYSTEMS AND PUMPS DID THE TRICK

To lay pipe in water-soaked sand 21 feet below water level is usually a difficult job—but—"DOMESTIC" Pumps and "DOMESTIC" Point Drainage gave firm sides and dry bottom trench on this job at Gary, Indiana.

If your job requires the drying up of specified areas—for trench work, foundation work, etc.—in water-soaked soils, our Bulletin No. 288 will interest you. This "copyrighted" illustrated booklet contains much data of real value to every Engineer and Contractor. A copy is yours FREE—for the asking.

"DOMESTIC" Drainage Systems give *Safety, Speed and Profits*

on jobs below the surface of water saturated soils.



Special Double Plunger Pump successfully used with "Domestic" Point Drainage Systems

DOMESTIC ENGINE & PUMP CO.

Shippensburg, Penna.

CM 5-29

Morris Non-Clogging Sewage Pumps

for handling raw sewage, pulp, trash, liquids holding semi-solids, etc.

These units have surprising ability to pass large solids. They stop the clogging nuisance, are extremely efficient and have extra heavy wearing parts that minimize renewal expenses.

Made in horizontal and vertical types with 3 to 20-in. openings and maximum capacities from 450 to 16,000 gal. per min. *Ask for additional data.*

MORRIS MACHINE WORKS, Baldwinsville, N. Y.

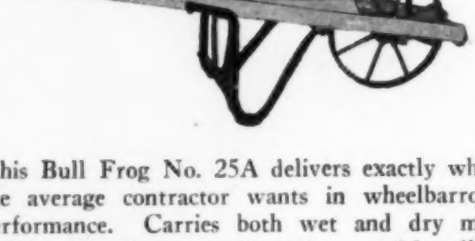
Originators of Centrifugal Pumps, both single and multi-stage, and builders for practically all purposes since 1864.

New York, Philadelphia, Cleveland, Chicago, Boston, Pittsburgh, Detroit, Charlotte, N. C.

MORRIS

CENTRIFUGAL PUMPS

Exactly Filling the Builder's Needs



This Bull Frog No. 25A delivers exactly what the average contractor wants in wheelbarrow performance. Carries both wet and dry materials. Seamless, pressed steel tray with rolled rim, mounted on riser. Built for hard work. Other Bull Frog barrows for every mill, mine, contracting, and industrial use. Write for catalog.

The Toledo Wheelbarrow Company

Toledo, Ohio

Branch Office and Warehouse
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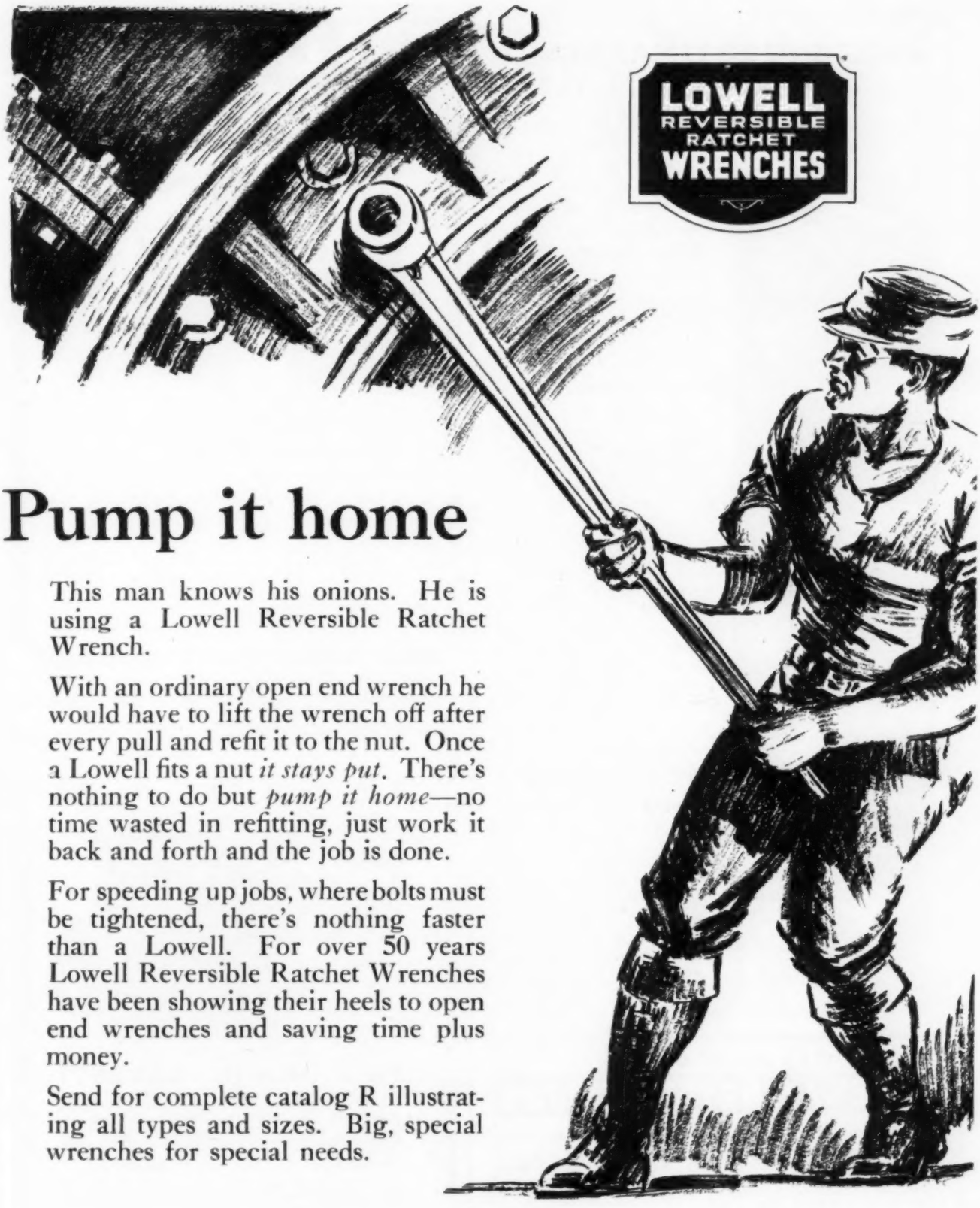
BULL FROG WHEELBARROWS



Pump it home

This man knows his onions. He is using a Lowell Reversible Ratchet Wrench.

With an ordinary open end wrench he would have to lift the wrench off after every pull and refit it to the nut. Once a Lowell fits a nut *it stays put*. There's nothing to do but *pump it home*—no time wasted in refitting, just work it back and forth and the job is done.

For speeding up jobs, where bolts must be tightened, there's nothing faster than a Lowell. For over 50 years Lowell Reversible Ratchet Wrenches have been showing their heels to open end wrenches and saving time plus money.

Send for complete catalog R illustrating all types and sizes. Big, special wrenches for special needs.

LOWELL WRENCH COMPANY

Worcester Mass.

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BUILDING ESTIMATORS' DATA BOOK

By CHARLES F. DINGMAN
Architectural Engineer

A practical book for the estimator. It contains specific data for every type of estimate—data usable for every job—data the estimator must use daily in his work.

Essential Information in condensed and tabulated form

This handy, pocket-size volume contains compressed, accurate data for each form of estimate from excavating, sheet piling and hauling to heating, plumbing and wiring.

It is compressed, standard, complete. It opens with statement and explanation of the arithmetic rules and tables involved in making quantity surveys and estimates; then proceeds to the practical application of these rules.

All of the data are based, not on money costs, but on the capacity of men and equipment.

158 pages, pocket size, flexible, 21 illus. $2.50

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VII. Carpenter Work.
VIII. Interior Marble Work—Tiling and Terrazzo.
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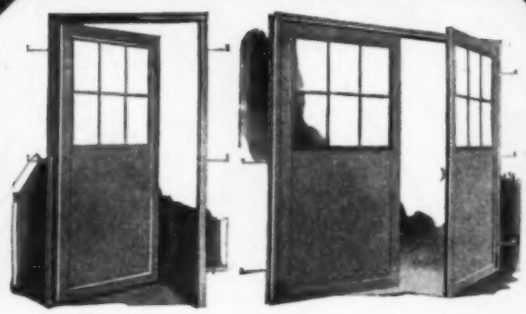
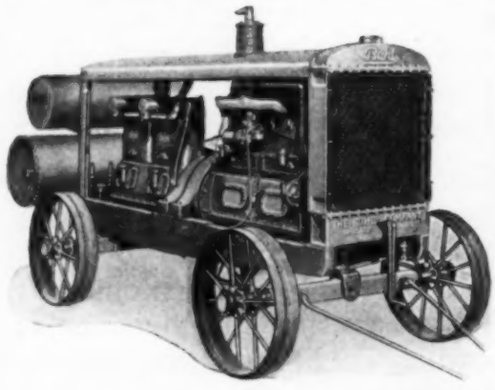


Slide, Swing, Lift, Folding, Lift-Swing and Hangar Doors. Standard and Special Types. Rigid, durable and fireproof.

Write for catalog and prices.

TRUSCON STEEL COMPANY
YOUNGSTOWN, OHIO
STEEL DOOR DIVISION
Warehouses and Offices in all Principal Cities



First with the LATEST!

The new BUHL Portable Compressor line is "Years Ahead" in air compressor design. It embodies numerous improvements never before offered in a portable compressor—improvements which are enabling their owners to produce air at a remarkable low cost.

Buhl Portable Compressors are made in 36, 55, 90, 100, 110, 220 and 330 cu.ft. displacements. Can be supplied with any mounting desired.

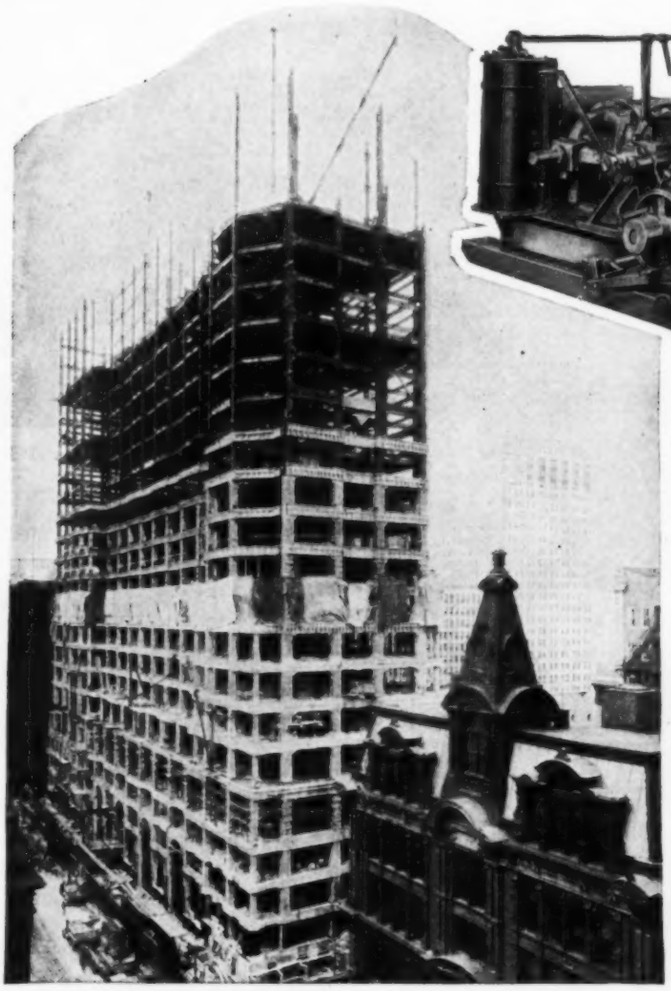
Write for Descriptive Literature.

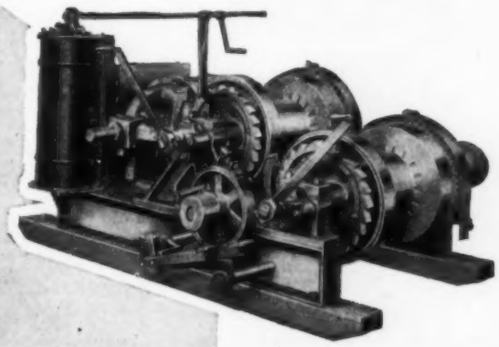
The BUHL Company
General Offices: Old Colony Bldg., Chicago

CLYDE HOISTS-DERRICKS

For efficiency, performance and adaptability, Clyde hoists are gaining more and more favor all over the country. Write for detailed information about any Clyde unit, telling you why your next machine should be a Clyde.

The electric hoist shown below is the type of machine used by W. E. Woods Co., for doing general hoisting duty on the Union Trust Building, Detroit, Mich.





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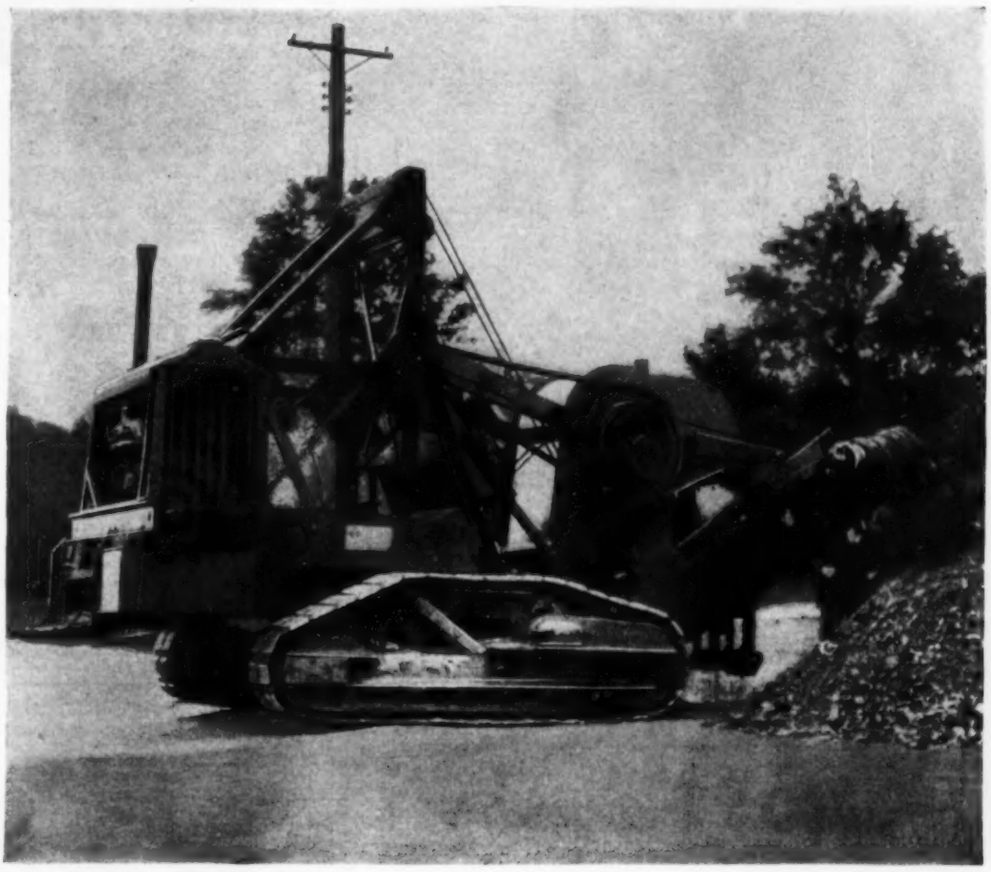
CLYDE TWO MARKS OF GUARANTEED QUALITY

SUCCESSFUL PERFORMANCE FOR AGC-A-TOR

On 15 Different Ditching Jobs 10,000 Feet Through Hardpan



7¢ Per Foot

Opr. 70 Days	$538.78
Gas	120.17
Oil	6.80
Truck Time	162.50
Other Labor	46.46
Moving Machine	402.50
Depreciation at 20%	756.00
Int. at 6%	226.63
Repairs	358.46
Extra Labor	178.60
Total	$2,796.90
Cost per foot is $2,796.90 ÷ 39,147	0.072

Accurate cost figures kept by the City of Seattle Water Department show how Barber-Greene Ditchers cut costs even on small jobs where the digging is exceedingly tough and moves are frequent.

Over a period of 70 working days, this Barber-Greene opened 39,147 feet of trench, on 15 different jobs—digging 10,000 feet through hardpan.

The expense of moving the ditcher from one job to another equalled almost one-third of the total ditching cost. But even including this expense, in addition to gas, oil, depreciation, maintenance, the operator's time, and other items listed, the average cost per foot of trench dug was only seven cents.

If you would like to see how others are licking high ditching costs, in some instances driving them as low as three cents per foot, send for your copy of "Ditching Snapshots and Records."

BARBER-GREENE COMPANY
530 W. Park Avenue Aurora, Illinois

BARBER GREENE

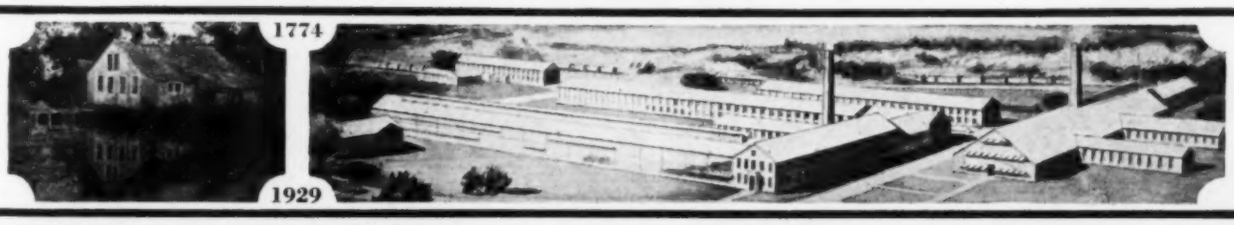
The new Ames R-MOR-D *handle*

exclusive on the Genuine

O. AMES

Your men can do their best work easier, using the new Ames R-MOR-D handle, with the big roomy grip—smooth sides and rounded edges —strong as an ox, the utmost in comfort and service, and exclusive on genuine O. Ames shovels.

Only the genuine O. Ames bears the signature "Oliver Ames". It will pay you to "look for the stars" on every shovel you buy.



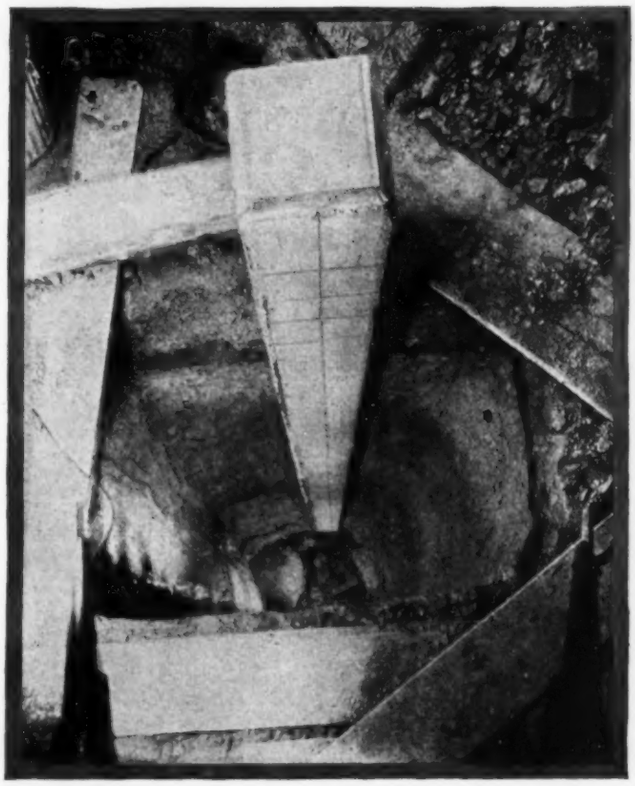
AMES SHOVEL AND TOOL COMPANY

NORTH EASTON ◂▸ MASSACHUSETTS

ST. LOUIS, MISSOURI - - - ANDERSON, INDIANA 2861

SAVING TWO WEEKS

In Foundation Work



Looking down into excavation made to point of pre-cast "INCOR" Concrete pile for purpose of observing effect of hammer blows. This pile withstood 90 blows from a 5000-lb. drop-hammer after it had been driven to bedrock. It was driven six days after casting, without sign of fracture. Manufactured by E. A. Whitney & Son, Kansas City, Mo.
(Excavation made for observation, after pile was driven)

SIX days after casting, a pre-cast pile made with "INCOR" Brand Perfected High-Early-Strength *Portland* Cement withstood 90 blows from a 5000-pound drop hammer after it had been driven to bedrock, on the site of the Kansas City Power and Light Company's new garage building on Wyandotte Street, Kansas City, Missouri.

Here, as in many other projects, the use of "INCOR" saved at least TWO WEEKS in foundation work, with a resultant saving in time and money for the engineer, contractor and owner. Indeed, "INCOR" concrete piles have been driven *48 hours after casting*, when time was particularly pressing.

"INCOR" Brand Perfected High-Early-Strength *Portland* Cement makes an unusually plastic, workable concrete. It is important to note that "INCOR" contains no admixtures, and requires no special methods of handling. "INCOR" produces permanent dependable *Portland* cement concrete that is service-strong in 24 hours.

Wherever time is the governing factor in solving an engineering or construction problem, it pays to use "INCOR".

INTERNATIONAL SYSTEM
LONE STAR CEMENT
PERFECTED HIGH-EARLY-STRENGTH
"INCOR"
PORTLAND CEMENT

Outstanding quality and a policy of fair business dealing have earned nation-wide recognition for LONE STAR Cement. Now, to meet the need for dependable 24-hour concrete, the makers of LONE STAR also offer "INCOR" Brand.

INTERNATIONAL CEMENT CORPORATION

342 Madison Avenue, New York

One of the world's largest cement producers—13 mills . . . total annual capacity 20,000,000 bbls.

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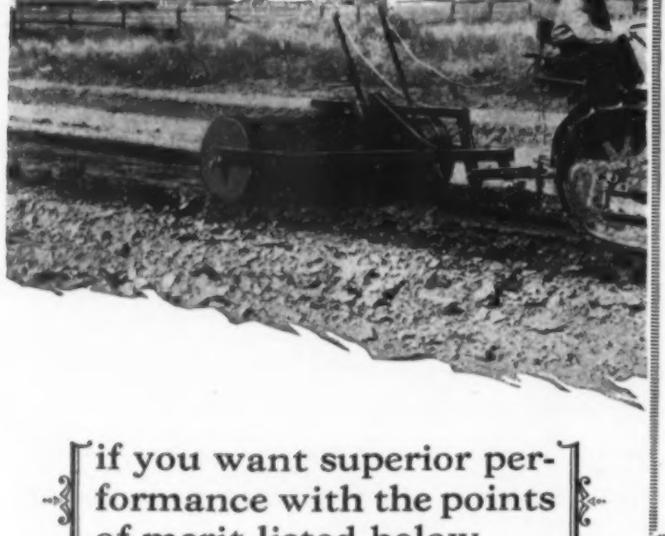
LONE STAR CEMENT CO. INDIANA, Inc.
Indianapolis, Indiana
THE CUBAN PORTLAND CEMENT CORP.
Havana, Cuba
LONE STAR CEMENT CO. PENNSYLVANIA
Philadelphia, Pennsylvania
THE LONE STAR CEMENT CO. (KANSAS)
Kansas City, Missouri
LONE STAR CEMENT CO. VIRGINIA, Inc.
Norfolk, Virginia
LONE STAR CEMENT CO. NEW YORK, Inc.
Albany, New York
LONE STAR CEMENT CO. LOUISIANA
New Orleans, Louisiana
ARGENTINE PORTLAND CEMENT CO,
Buenos Aires, Argentina
LONE STAR CEMENT COMPANY TEXAS
Dallas and Houston, Texas
URUGUAY PORTLAND CEMENT COMPANY
Montevideo, Uruguay

Investigate

Killefer Scrapers—



if you want superior performance with the points of merit listed below . . .

Simple adjustment of load size to suit tractor power--

An accurately adjusted "bite"--

Heavy reversible shoes with increased wearing qualities, made by a process new to the manufacture of drag scrapers.

Two bolted-in, interchangeable blades--

Ease of control—by the tractor operator--

A full line of sizes from 4' to 8' wide, in capacities from 18 to 75 cubic feet, conservative dirt measure--

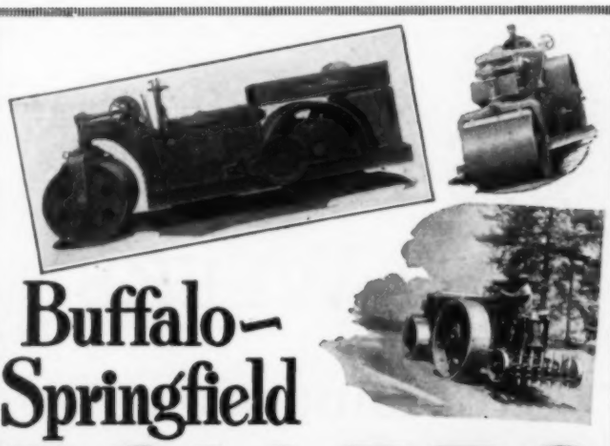
Each tool strong, heavy, and reasonably priced.

Our 7' size is shown above. These tools have been 6 years on the American market. There are hundreds of enthusiastic users.

Dealers throughout the United States and Canada. For literature write Killefer Mfg. Corp., 5525 Downey Road, Los Angeles, Calif.

431 Fifth Street
SAN FRANCISCO, CALIF.

1321 So. Washington St.
PEORIA, ILLINOIS



Buffalo-Springfield ROLLERS

The wide spread adoption of Buffalo-Springfield Rollers can mean only one thing—that the builders of our roads and streets consider them the most practical and the most dependable rollers on the market. It is the old adage, "values will tell" reasserting itself.

All practical sizes, both steam and motor driven. Scarifiers and other special attachments when desired.

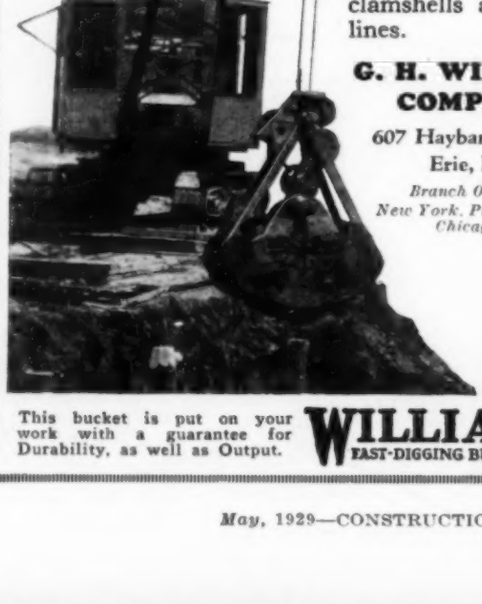
When in the market, investigate the Buffalo-Springfield. Write for illustrated booklet describing the entire line.

The Buffalo-Springfield Roller Co.
Springfield, Ohio

The fastest bucket built
keeps your crane *speeded up*

The WILLIAMS Power-Arm combination of lever and block-and-tackle builds up greater digging power *faster*—by doing it with a shorter cable overhaul.

And does it in the one way that gives a *straight line* closing pull.



Write for our Bucket Book, showing the complete WILLIAMS line of clamshells and draglines.

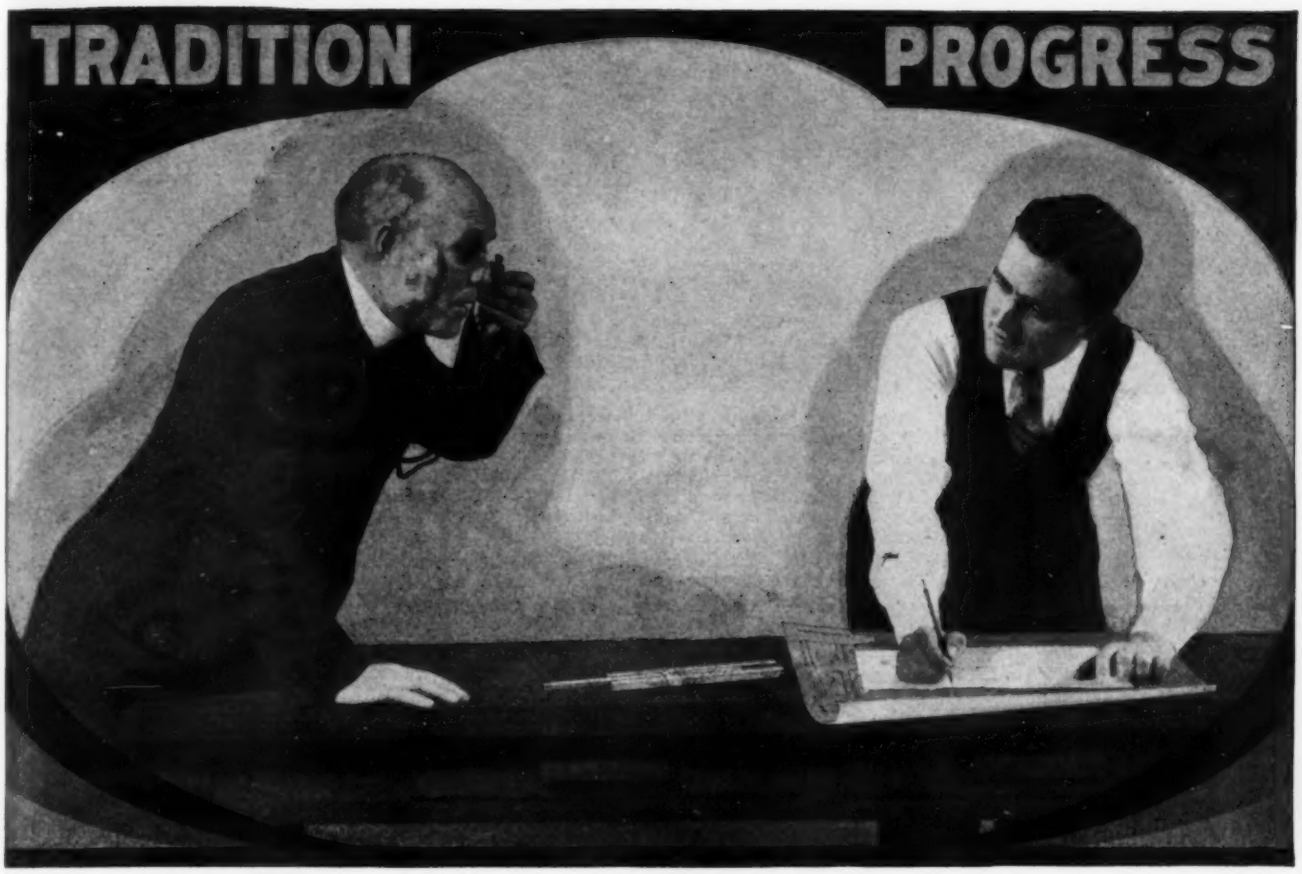
G. H. WILLIAMS COMPANY

607 Haybarger Lane
Erie, Pa.

Branch Offices: New York, Pittsburgh, Chicago.

This bucket is put on your work with a guarantee for Durability, as well as Output.

WILLIAMS FAST-DIGGING BUCKETS



"Here, Lad—

we've got to do something to get a better percentage of the work we bid on.

Maybe we'll have to come to cutting prices."

The Lincoln "Stable-Arc" Welder

—welds easier
—makes better welds
—permits greater output

because of the steady uniform arc throughout entire welding range, which is the result of:

Variable voltage design
Laminated magnetic circuit
Separately-excited generator field
Double control of welding heat
All steel construction

No other welder has all these features.

"Fine, Pop—

by eliminating the last two words, you've found the answer.

And when we've *come to,* and felt the pulse of the times, we'll see that most of the *best* jobs and the biggest jobs are going to arc welding, *of course.* BUT there's more to it than that:

If we *come to* sufficiently, we'll find that these jobs are going to Lincoln Welder users because they can outspeed machines having lesser qualifications.

I was just reading in a trade paper where a gang of three welders completed 13,900 feet of 8-inch pipe line in one day. (Reprint of this article with job details on request.)

So until we quit bidding against 'Stable Arc' welding and start bidding WITH it, we're simply bucking traffic on a one-way street—and the ticket we'll get won't be a meal ticket."

The Lincoln Electric Co., Dept. No. 32-5, Cleveland, Ohio

W-77

"Stable Arc"

LINCOLN WELDER

Who's Getting the Big Contracts?

A Monthly Guide to Where the Construction Dollar is Being Spent

New England

Dorchester, Mass.
Sect. 5B, Rapid Transit: $256,425
W. H. Sullivan, 50 Dartmouth St., Somerville.

Massachusetts
State highway: $113,405
Kelleher Corp., Turners Falls.

Worcester, Mass.
Factory: $200,000
E. J. Cross Co., Foster St.

Hartford, Conn.
Service garage: $400,000
Industrial Constr. Co., 721 Main St.

Arlington, Mass.
Apartment: $150,000
F. A. Greenley, 48 Tremont St., Walden.

Cambridge, Mass.
Apartment: $150,000
E. R. Boyle, 129 Newbury St., Boston.

Springfield, Mass.
Apartment: $150,000
Beaumier & Guerin, Inc., 24 Belmont Ave.

Bridgeport, Conn.
Bank: $150,000
T. J. Pardy Constr. Co., 1481 Seaview Ave.

Darien, Conn.
Theatre: $200,000
T. J. Pardy Constr. Co., 1481 Seaview Ave., Bridgeport.

Lawrence, Mass.
Store and office: $400,000
W. J. Delaney, 383 Essex St.

West Roxbury, Mass.
Bank: $150,000
I. H. Bogart & Son, 69 Newbury St., Boston.

Massachusetts
State highway: $846,875
Waterbury Road & Constr. Co., Inc., Mansfield Depot, Conn., and others.

Clinton, Conn.
Factory: $250,000
Aberthaw Constr. Co., 80 Federal St., Boston, Mass.

Boston, Mass.
Court and office: $150,000
Gerry & Northrop, 494 Harrison Ave.

Lowell, Mass.
Store: $150,000
R. E. Runels Constr. Co., Hilldreth Bldg.

Middle Atlantic

Secaucus, N. J.
Airport: $1,500,000
W. F. Carey & Co., 44 Wall St., New York.

New Jersey
State highway: $1,193,053
C. T. Kavanaugh, 780 Bway., Bayonne, and others.

Newark, N. J.
Paving: $384,023
Hugh Gilligan & Son, 133 First St., and others.

Pennsylvania
State highway: $526,822
Chas. Winters Constr. Co., Butler, Pa., and others.

Camden, N. J.
Factory: $1,000,000
Barclay White & Co., 22 N. 36th St., Philadelphia, Pa.

Bloomsburg, Pa.
Spinning mill: $300,000
Dresser Co., Cleveland, O.

Mt. Lebanon, Pa.
Apartment: $300,000
Rubenstein Constr. Co., Pittsburgh.

Philadelphia, Pa.
Apartment: $300,000
Philip Haibock Constr. Co., 1261 N. 26th St.

New York, N. Y.
Bank: $300,000
J. H. Carl & Son, 614 E. 14th St.

New York, N. Y.
Club and apartment: $750,000
Barr & Lane, 347 Madison Ave.

Philadelphia, Pa.
Clubhouse: $500,000
F. V. Warren Co., 1913 Arch St.

Philadelphia, Pa.
Relocating subway: $1,919,445
Underpinning Foundation Co., Finance Bldg.

Atlantic City, N. J.
Incinerator: $323,500
Nye Odorless Incinerator Corp., Macon, Ga.

New York, N. Y.
Paving: $484,900
Asphalt Constr. Co., 2197 Madison Ave., and others.

New York, N. Y.
Apartment: $325,000
Ryan Building Co., 1710 Montgomery Ave.

South

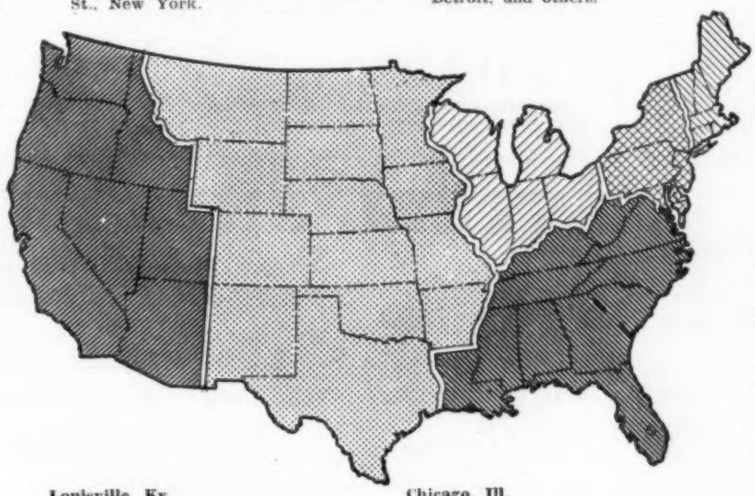
Atlanta, Ga.
Sewer: $211,509
C. A. Pitman, 436 Whitehall St.

Richmond, Va.
Paving: $225,000
Old Dominion Constr. Co., Richmond, and others.

Clifton Forge, Va.
Roundhouse: $350,000
John W. Cowper Co., Inc., Richmond.

So. Charleston, W. Va.
Factory: $1,225,000
H. K. Ferguson Co., Cleveland, O.

Blue Ridge, Ga.
Hydro-electric plant: $4,500,000
Stevens & Wood, Inc., 20 Pine St., New York.



Louisville, Ky.
Factory: $350,000
Struck Constr. Co., 147 No. Clay St.

Hattiesburg, Miss.
College: $285,800
Oden & Glenn, Hattiesburg.

Charlotte, N. C.
Church: $130,000
Southeastern Constr. Co., Charlotte.

Anniston, Ala.
Battalion barracks: $279,850
J. F. Holley Constr. Co., Ensley.

Alabama
State highway bridges: $156,493
E. Pettus, Montgomery, Ala., and others.

Alabama
State highway paving: $1,275,451
Newell Constr. Co., Birmingham, and others.

Newall, W. Va.
Pottery plant: $500,000
H. K. Ferguson Co., Cleveland, O.

Middle West

Columbus, Ohio
Sewer: $319,844
A. Phelps & Sons, 6319 Michigan Ave.

East St. Louis, Ill.
Levee and Sanitary Dist.: $409,300
H. H. Hall Constr. Co., Murphy Bldg.

Dayton, O.
Factory: $800,000
H. R. Blagg Co., 1229 E. 3rd St.

Chicago, Ill.
Apartment: $1,000,000
Wahl Constr. Co., 3310 Belmont Ave.

Chicago, Ill.
Hospital: $600,000
F. H. Stowell Co., 111 W. Monroe St.

Cleveland, O.
Telephone exchange: $300,000
Crowell & Litte Constr. Co., Cleveland.

Cincinnati, O.
Convent: $300,000
M. J. Roche Constr. Co., Southern Bank Bldg.

Park Ridge, Ill.
Paving: $493,789
Arcole Constr. Co., Evanston, Ill.

Ft. Wayne, Ind.
Paving: $322,154
Grace Constr. Co., Ft. Wayne.

Michigan
State highway: $415,000
State Constr. Div., C. M. Ziegler, Supt., Lansing.

Michigan
State highway: $363,647
R. D. Baker Co., Outer Drive, Detroit, and others.

Chicago, Ill.
Factory: $1,000,000
R. C. Weiboldt & Co., 1412 W. Washington Blvd.

East St. Louis, Ill.
Roundhouse: $400,000
Ellington Miller Co., 417 So. Dearborn St., Chicago.

Chicago, Ill.
Apartment: $300,000
A. & E. Anderson Co., 228 No. La Salle St.

Chicago, Ill.
Office and store: $750,000
Paschen Bros., 111 W. Washington St.

West of Mississippi

Texas
Highway bridges: $317,660
Purvis & Bertram, 112½ W. 9th St., Ft. Worth, and others

Oklahoma City, Okla.
Bridge: $600,000
Union Bridge Co., 1205 Midland Bldg., Kansas City, Mo.

Texas
State highway: $742,385
Standifer Bros., P. O. Box 193, Big Wells, and others.

St. Louis, Mo.
Soap factory: $250,000
H. K. Ferguson Co., Cleveland, O.

Little Rock, Ark.
High school: $300,000
Stewart & McGehee Constr. Co., Kahn Bldg.

Model, Colo.
Gas booster plant: $500,000
Under supervision of Ford, Bacon & Davis, 39 Broadway, New York

Great Falls, Mont.
Flour mill: $300,000
Barnet & Record Co., 805 South East 9th St., Minneapolis, Minn.

Schulenburg, Tex.
Milk plant: $300,000
Carnation Milk Products Co., owner builds.

Little Rock, Ark.
Bank: $200,000
Geo. H. Burden Co., Moore & Turner Bldg.

Marshalltown, Ia.
Theatre and office: $565,000
T. Stark & Co., 118 So. 11th St., Cedar Rapids

St. Paul, Minn.
Office: $200,000
Arnold Constr. Co., 510 Guardian Life Building

South Dakota
Open drains: $107,609
Kremer & Hog, 340 Gateway Bank, Minneapolis, Minn.

Port Arthur, Tex.
Wharf: $400,000
William Constr. Co., New Orleans, La.

Woodward, Okla.—Pratt, Kans.
Gas pipe line: $1,000,000
R. O. Moore Co., Dallas, Tex.

Tulsa, Okla.
Schools: $278,156
Ruck Brandt Constr. Co., 1012 Mid-Continent Bldg., and others

Far West

San Francisco, Calif.
Paving: $374,396
Eaton & Smith, 715 Ocean Ave.

South Gate, Calif.
Paving: $507,750
H. H. Walker, 1323 Venice Blvd., Los Angeles

Wilmington, Calif.
Cracking plant: $700,000
M. W. Kellogg Co., Jersey City, N. J.

Long Beach, Calif.
Department store: $400,000
R. E. Campbell, 130 Lincoln Ave.

Los Angeles, Calif.
Office building: $500,000
Salih Bros., Quimby Bldg., Los Angeles

Santa Monica, Calif.
Store and office building: $300,000
R. C. Jones, 245 N. Beverly Drive, Beverly Hills

Los Angeles, Calif.
Apartment: $300,000
J. C. Bannister, 633 Hollywood Blvd.

Crescent City, Calif.
Hotel: $500,000
L. H. Bailey, Oakland, Calif.

Los Angeles, Calif.
Office: $500,000
Luther T. Mayo, Inc., 829 Black Bldg.

San Francisco, Calif.
Hotel: $1,000,000
J. L. McLaughlin, 251 Kearny St.

Bellingham, Wash.
Hotel: $500,000
Western Constr. Co., Seattle

Seattle, Wash.
Office: $3,500,000
A. W. Quist & Co., Hoge Bldg.

Los Angeles, Calif.
High school: $286,900
Pozzo Constr. Co., 421 Macy St.

San Francisco, Calif.
School: $465,675
Jacks & Irvine, Call Bldg.

Westwood, Calif.
College: $243,650
Westcott Co., 710 So. Garfield Ave.

SEARCHLIGHT SECTION

EMPLOYMENT—BUSINESS OPPORTUNITIES—EQUIPMENT

UNDISPLAYED—RATE PER WORD:

Positions Wanted, 5 cents a word, minimum $1.00 an insertion, payable in advance.

Positions Vacant and all other classifications, 10 cents a word, minimum charge $2.00.

Proposals, 50 cents a line an insertion.

INFORMATION:

Box Numbers in care of any of our offices count 10 words additional in undisplayed ads.

Discount of 10% if one payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals.)

DISPLAYED—RATE PER INCH:

1 inch $7.50
2 to 3 inches ..... 7.25 an inch
4 to 7 inches ..... 7.00 an inch

An Advertising inch is measured vertically on one column, 3 columns—30 inches—to a page.

C.M.

POSITION VACANT

POSITION vacant—men are needed to fill the many positions that are continually opening up in the construction field. There is no more effective way of telling the executives who hire men that you have the qualifications that they want than by an advertisement inserted in these columns of Construction Methods. By doing this you can reach over 30,000 men in the field, many of whom may be looking for men of your experience and qualifications. Communicate with Searchlight Department, Tenth Ave. at 36th Street, New York City.

POSITIONS WANTED

POSITIONS wanted—positions are wanted by men who read this paper and who can be reached through these columns. Men in the construction field, throughout the country, are always interested in what you have to offer them. Tell them about the openings in your organization and from the large number of applicants who will probably be interested you can pick the man who will be able to completely fill the position. Address Searchlight Department, Tenth Ave. at 36th St., New York City.

ALPHABETICAL INDEX TO ADVERTISERS

This index is published as a convenience to the reader. Every care is taken to make it accurate, but *Construction Methods* assumes no responsibility for errors or omissions.

LEGAL NOTICE

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912

Of Construction Methods, published monthly at New York, N. Y., for Apr. 1, 1929.

State of New York } ss.
County of New York }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared C. H. Thompson, who, having been duly sworn according to law, deposes and says that he is the Secretary of the McGraw-Hill Publishing Co., Inc., publishers of Corstruction Methods, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, McGraw-Hill Publishing Co., Inc., 10th Ave. & 36th St., N. Y. C. Editor, Robert K. Tomlin, Jr., 10th Ave. & 36th St., N. Y. C. Managing Editor, none. Business Manager, A. B. Cozzens, 10th Ave. & 36th St., N. Y. C.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) McGraw-Hill Publishing Company, Inc., 10th Ave. & 36th St., N. Y. C., Stockholders of which are: James H. McGraw, 10th Ave. & 36th St., N. Y. C. James H. McGraw, Jr., 10th Ave. & 36th St., N. Y. C. James H. McGraw, James H. McGraw, Jr., and Malcolm Muir, 10th Ave. & 36th St., N. Y. C., Trustees for: Harold W. McGraw, James H. McGraw, Jr., Donald C. McGraw, Curtis W. McGraw. Curtis W. McGraw, 10th Ave. & 36th St., N. Y. C. Donald C. McGraw, 10th Ave. & 36th St., N. Y. C. Harold W. McGraw, 10th Ave. & 36th St., N. Y. C. Joseph H. Bragdon, 10th Ave. & 36th St., N. Y. C. Anne Hugus Britton, 10th Ave. & 36th St., N. Y. C. Mason Britton, 10th Ave. & 36th St., N. Y. C. Edgar Kobak, 10th Ave. & 36th St., N. Y. C. Grace W. Mehren, 2440 Lake View Ave., Chicago, Ill. J. Malcolm Muir & Guaranty Trust Co. of New York, 140 Broadway, N. Y. C., Trustees for: Lida Kelly Muir. F. S. Weatherby, 271 Clinton Road, Brookline, Mass. Edwin S. Wilsey, 10th Ave. & 36th St., N. Y. C. Goldman, Sachs & Co., 30 Pine Street, N. Y. C., a Partnership, Partners of which are: Waddill Catchings, 30 Pine Street, N. Y. C. Arthur Sachs, 30 Pine Street, N. Y. C. Walter E. Sachs, 30 Pine Street, N. Y. C. Howard J. Sachs, 30 Pine Street, N. Y. C. Sidney J. Weinberg, 30 Pine Street, N. Y. C. Henry S. Bowers, 30 Pine Street, N. Y. C.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is (This information is required from daily publications only.)

McGRAW-HILL PUBLISHING COMPANY, INC.
C. H. THOMPSON, Secretary.

Sworn to and subscribed before me this 29th day of March, 1929.
[Seal.] H. E. BEIRNE.
Notary Public N. Y. Co. Clks No. 97, Reg. No. 1B84, Kings Co. Clks No. 646, Reg. No. 1089.
(My Commission expires March 30, 1931.)

Champion Super Service Pneumatic Tool Hose

Champion Super Service Pneumatic Tool Hose is another important item in Republic's Champion Super Service Group.

Every part of the hose from the tube to the cover has been quality constructed to make it a real Champion.

CHAMPION SUPER SERVICE PNEUMATIC TOOL HOSE

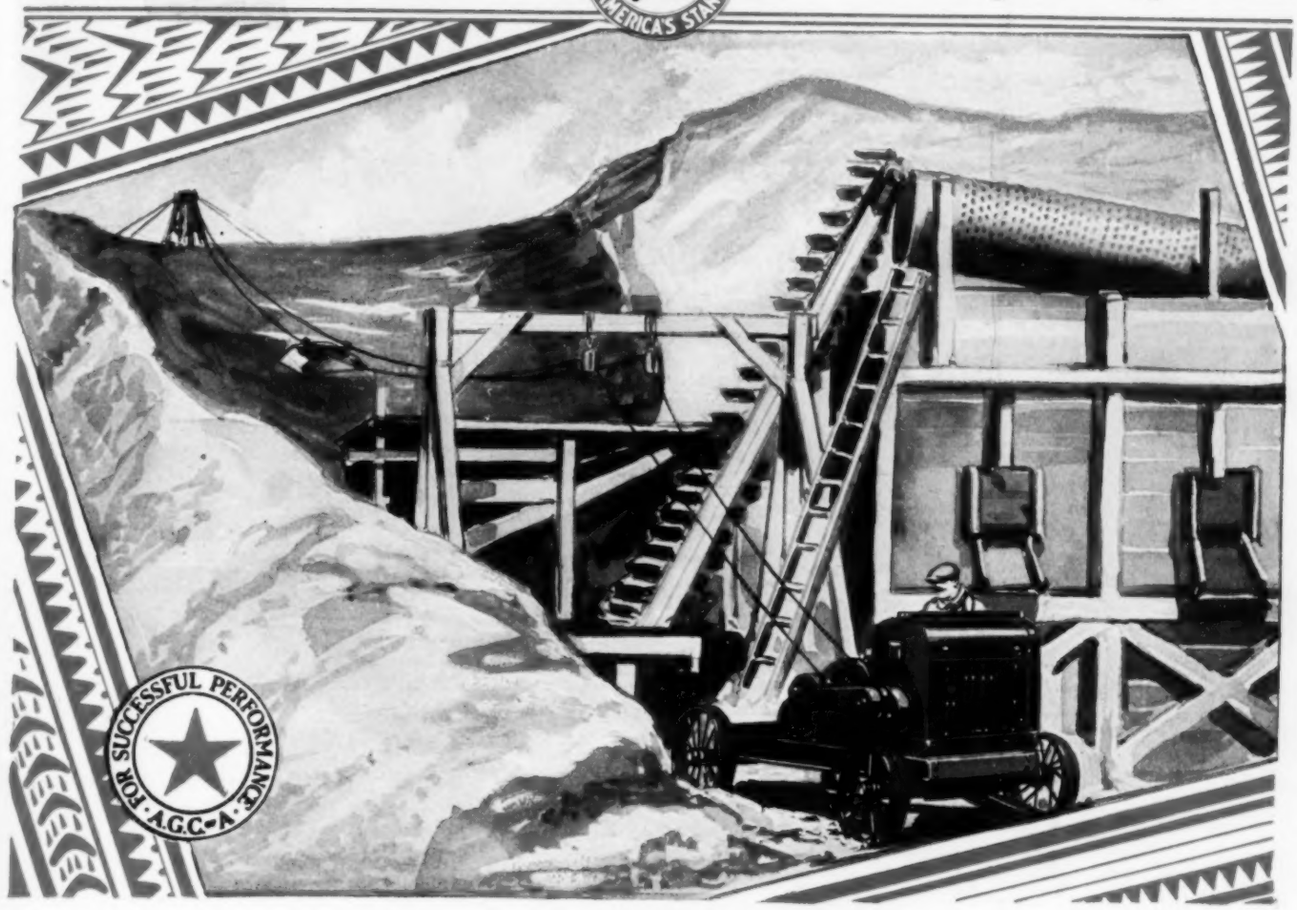
PRODUCTS such as the one featured above are representative of Republic's growing reputation for exceptional quality. You know the advantage you gain from a factory by making volume purchases—but—consider the investment and storage costs on a single commodity in contrast with their elimination when you arrange with your distributor for ready stock at your call. Your contract advantage gives him purchasing power which immediately returns to you in quality and price. Ask your distributor about Republic rubber.

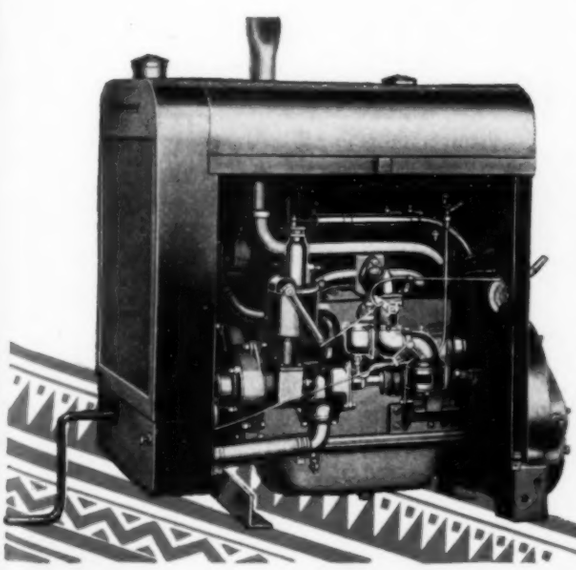
THE REPUBLIC RUBBER CO.
Youngstown, Ohio

Belting - Packing - Hose
Molded Goods - Lathe Cut Goods

REPUBLIC means the Best Mechanical Rubber Goods

Dependable Power for Every Purpose





SAUERMAN Portable Scrapers, powered by Heavy Duty Continental Engines are being rapidly chosen by large contractors as standard equipment in excavating work.

Power and ruggedness are necessities in this field and Continental Engines furnish one of the main attributes to successful operations. The years of continuous service which they insure spell greater profits to far-seeing contractors.

CONTINENTAL MOTORS CORPORATION
INDUSTRIAL EQUIPMENT DIVISION
Office and Factory: Muskegon, Michigan
The Largest Exclusive Motor Manufacturer in the World

Continental Engines

The MULTIFOOTE *power operator*

AUTOMATIC CONTROL *plus the* BRAINS *of the operator*

THE MultiFoote Power Operator permits taking advantage of every fraction of a second. There is no delay discharging because the next load of aggregate isn't in the skip as is often the case with a mechanical mixing cycle and when the load is in ahead of time the skip can be raised and held ready for the batchmeter bell.

The power operator starts the skip and turns on the water by power. It takes but a touch of the little finger on the lever and presto—action starts instantly giving the clipped second speed that comes with power operation—but at the correct moment.

See this new MultiFoote device. Let us tell you more about it.

THE FOOTE COMPANY, Inc.
of Nunda, N. Y.

Frank E. Hall WORLD'S LARGEST EXCLUSIVE BUILDERS OF ROAD PAVERS
152 W. 42nd St., New York City

Wilcox Brothers, Inc.
588 Chenango St., Binghamton, N.Y.

E. J. McHarg & Co.
31 Crestmont Rd., Binghamton, N.Y.

MultiFoote Sales Company
2811 West Fulton St., Chicago, Ill.

Burton Franklin
Volunteer Bldg., Chattanooga, Tenn.

Edward R. Bacon Company
Folsom at 17th St., San Francisco, Calif.